101

Inside: Syllabus2004 Annual Summer Conference Brochure

Syllabus

TECHNO[illegible] OR HIGHER EDUCATION

APRIL 2004 • VOL. 17, NO[illegible]

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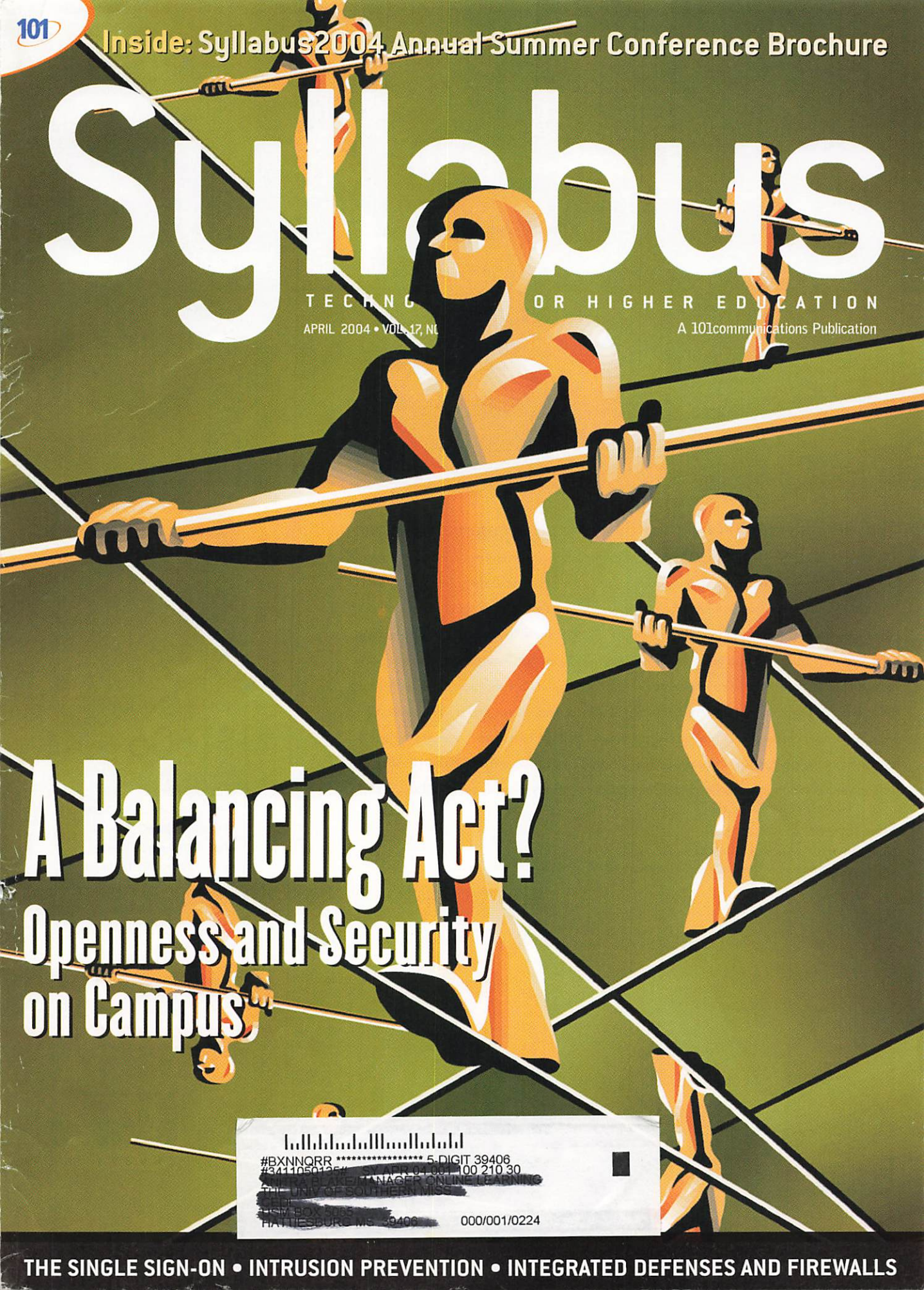

A Balancing Act?

Openness and Security on Campus

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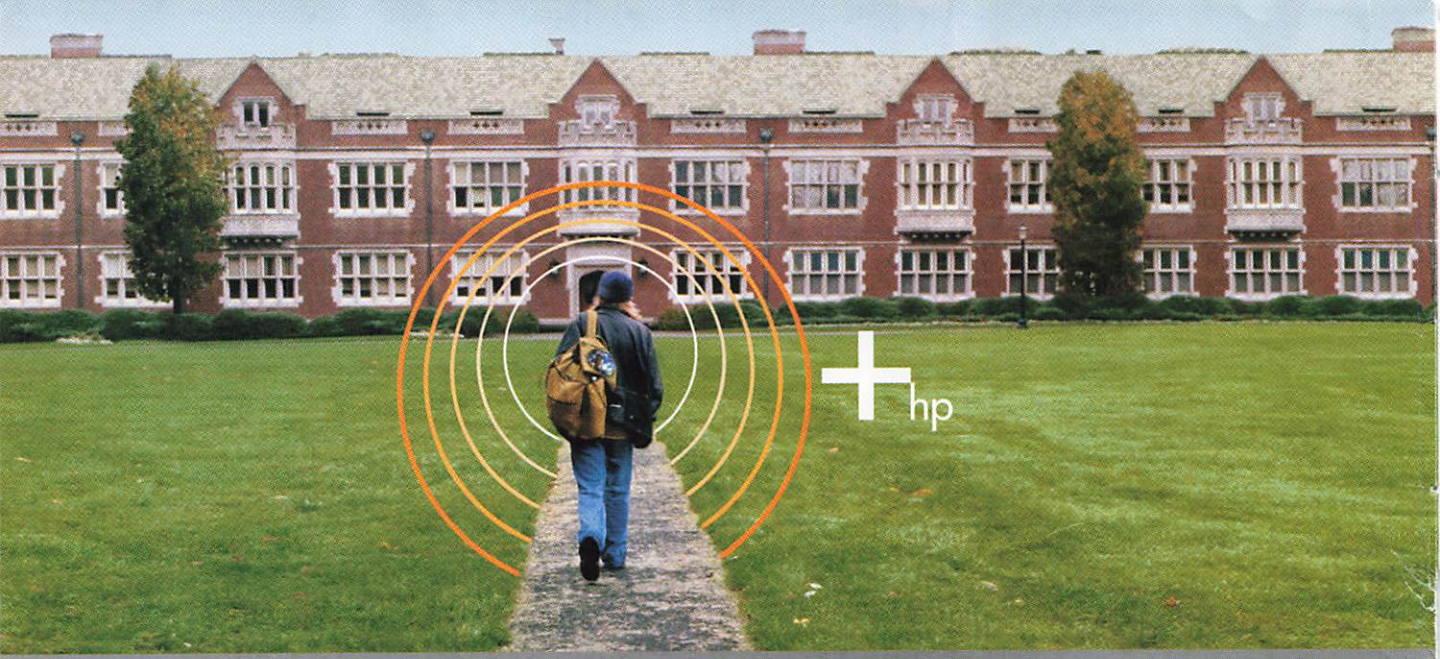

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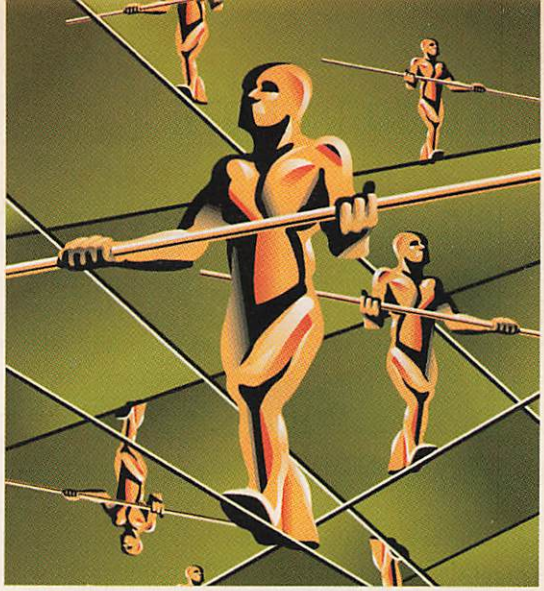

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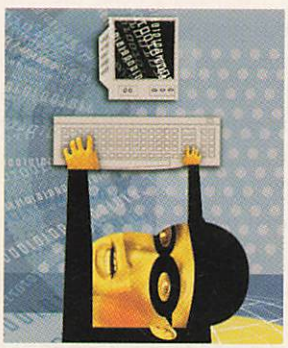

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EDITOR'S NOTE

Mary Grush, Editor

Sometimes campus users, concerned about viruses, worms, and other threats that plague networked computing environments, express today's security issues in terms of a polarity—with openness and security on opposite sides of some imaginary tradeoff. Naturally, these users value the kind of freedom that helped to foster much of the seminal work on the Internet itself—from the early days of the Arpanet (in which several academic institutions collaborated), to the first public, widely-used e-mail client applications (e.g., Eudora, created at the University of Illinois) and early Web browsers (the earliest, Mosaic, came out of NCSA at the U. of I. in 1993), to the more recent developments in advanced networking and collaborative applications springing up at Internet2 institutions. Indeed, it would be a terrible irony if crippling restrictions in the name of security were to be imposed at the very institutions that contributed so substantially to the development of the Internet network. But, maybe there's no need for alarm—especially if what we're looking at is not a causal relationship after all.

In our lead feature interview, MIT network manager Jeff Schiller fields the security-vs.-openness question as quickly and effectively as a disinfecting virus scan—"If you look at the security problems we have today, they're in fact *not* due to the openness of the network. They're due to the software that people run." (page 10). Placing the responsibility squarely on the user's PC probably seems radical, given the expectations we've all developed as network users for security services at the network level. But stepping back and placing more of the burden at the user's PC may in fact be the most thorough, direct solution. Schiller goes on to say that we need *both* security and openness. While it may not be necessary to sacrifice one for the other, providing both will certainly be a balancing act. Other articles in this issue cover different aspects of the increasingly complex security environment on campus.

Also in this magazine, you'll find our first column devoted to the "Campus Enterprise" (page 20). I'd like to welcome Annie Stunden as our new columnist, who writes from the CIO's desk at the University of Wisconsin-Madison. Annie will offer her observations about what she calls the "enterprise quilt"—the layering of interrelated systems and applications that make up the campus computing environment. We feel that the addition of this column reflects a shift in education technology in general, with greater emphasis on issues at the enterprise level. Due to space considerations, "Faculty Practice" and "Distance Learning" will no longer appear as regular columns. But Sally Johnstone and David Brown have agreed to write articles on an occasional basis. We thank them for their many columns and look forward to their future article contributions.

Please take a look at the Syllabus2004 brochure, bound in this issue (between pages 22 and 23.) In it, you'll find details about this year's annual summer conference, held in downtown San Francisco, July 18-22, with a full-day excursion to the U.C.-Berkeley campus. Make your plans now to attend!

Enjoy this issue of *Syllabus*!

Mary Grush

Letters to the editor should be addressed to the editor and sent to 101 First Street, #605, Los Altos, CA 94022, or via electronic mail (mgrush@syllabus.com). We reserve the right to edit all submissions. **News and product information** will be considered for publication. Please send all materials to Paul McCloskey. If you are interested in writing for *Syllabus*, please send a brief description of your article idea along with writing samples to the editor at the above address.

Syllabus
TECHNOLOGY FOR HIGHER EDUCATION

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Phillip D. Long

TRENDS

AN INFORMATION RESOURCE OF INTEREST TO EDUCATORS

Weak Link in Net Security? Not the Technology

BRIEFS

- **SunGard Data Systems** acquired education platform maker Collegis, following its December deal for SCT Corporation, another vendor of administrative software and services to colleges.
- Ten higher education institutions launched the **Innovator's Circle,** to aggregate and report on trends in e-procurement.
- **Sun Microsystems** rolled out the **Sun Java Desktop System** to higher education, at $25 per desktop per year for desktop software, maintenance, support, and training.
- **Duke's** online MBA program cost $107,000, the most expensive online MBA in the country, according to GetEducated.com, a counseling center for adult learners.
- A consortium of universities launched **Network T2,** to help commercialize university-based technology and product research.

For these and other news stories, or to subscribe to our eNewsletters, Syllabus News Update, eLearning Dialogue, and Syllabus IT Trends, visit www.syllabus.com.

The public perception of the Internet is that it's insecure. We're constantly hearing stories of identity theft, bombarded by unsolicited offers for the medically improbable, or generally wary of predators lurking in the ether. It was initially intended to be robust, not necessarily secure. Today that need is great.

Those who opted out of the Internet all together provided an early answer to secure networking. Why bother with the risks? If you could afford your own private network you were much more likely to rest easy at night as the gathering storm of Internet hacking turned from challenge to criminal intent.

The Net has grown up and with it the need to provide services that are secure, and transacted between known parties. You need to validate with whom you are electronically interacting, and be sure the content of the information exchanged is authentic, unaltered by any middleman acting to invisibly pass messages and read their content.

Public Key Infrastructure:
(noun) a system of digital certificates, Certificate Authorities, and other registration authorities that verify and authenticate the validity of each party involved in an Internet transaction.

Webopedia.com
http://www.webopedia.com/TERM/P/PKI.html

That's good for business but what do academics gain from a secure infrastructure? Many academic interactions need flexible mechanisms that manage access based on complex attributes among distributed populations and organizations. Here's a sampling, but you can envision many others.

Applications for federal student loans and related financial services. The federal government is developing secure transactions systems to allow the transfer of personal information required by various public agencies to process loans and other financial awards.

Expanded use of campus directory systems. Making directories interoperable among campuses could make it easy to create secure cross-institutional mailing lists. If directories were secure, those listed in them might be willing to disclose more about themselves, their research interests, or other data, confident that those accessing this information were only from among the community to which they belong.

Electronic assignment turn-in with time-stamps. With the increase in course management systems, a standard and secure way to determine that submissions originated from a specific student, have not been electronically tampered with and were submitted by the assigned deadline is becoming imperative.

Replacing IP address access controls restricting licensed library materials. Internet Protocol address (IP) controls are the standard method used by many academic library database vendors to provide access control to site licensed materials purchased by libraries. This causes difficulties for traveling faculty or students and anyone using some other ISP to obtain Internet access from home or elsewhere.

Faculty and student transactions with campus administrative systems. Course enrollment, applying for housing, and managing debit accounts are among business interactions occurring daily in academic institutions. Using electronic documents with multiple signatures that cannot be repudiated has applications in

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these as well as payroll actions, benefits selection, and grant submission. Use of these systems requires, the individual be able to trust the computation, obtain appropriate confirmation, and protect their data from theft.

Secure wireless network access. Wireless networks are rapidly becoming the norm rather than the exception on our campuses. Ask your network administrators how they are securing their network from unauthorized use.

Public Key Infrastructure

The most promising strategy for achieving secure net transactions is to deploy public key infrastructure. Encryption technologies are difficult to grasp and communicate, even by those doing their development. There are two considerations to keep distinct. The first are the encryption approaches applied to encode information so it cannot be read or altered by anyone but the intended recipient. The second is the mechanism by which the identity of either the sender or the recipient is determined, whether or not the information sent is protected. The infrastructure needed to enable all of this depends on the particular security strategies used, but here we'll concentrate on so-called public key approaches.

Public-key cryptography uses a pair of mathematically related algorithms called keys. If one key is used to encrypt information, then only the related key can decrypt that information. The trick is you can't easily decipher one from knowing the other. One key, the public key, you make widely known. The other key, the private key, you keep secret. Someone sending you confidential information, their homework, for example, encrypts the message with your public key[1]. Let's assume that was available from a campus directory service. The recipient, you in this example, uses a private key to read the information. You are assured that the homework sent has not been tampered with or altered. What you don't know for sure is if the person sending the homework was in fact your student.

Key[2]	Key Type	Key Use By
Encrypt data for sending	Public Key	Recipient
Digitally sign message	Private Key	Sender
Decrypt received message	Private Key	Recipient
Verify signature	Public Key	Sender

Authenticating the sender. A digital signature is accomplished by using a private key to sign the message, based on a mathematical algorithm determined by the content of the message itself. It is therefore different for every message, but the process by which it is derived is a function of the key. The algorithm determines a value, called a hash value, and attaches it to the message either directly within it or as a corresponding separate file. The corresponding public key must be available to decrypt the value and reverse the algorithm confirming the sender's signature. Note that anyone receiving the message (digitally signed) can read the contents and determine from whom it was sent. There is no confidentiality here. Privacy is a function of the first process, not the second.

Certificates. To manage public keys, a certificate (CA) is used that contains user information, an expiration date, usage criteria, the issuer of the certificate, and related data. The certificate is digitally signed to validate who issued it. It is the protection and management of the certificates that is a major concern for PKI. The certificate is installed on your computer. If someone has access to that, the information therein is easily read. Hence, you need to password-protect access to your certificate.

Who makes the password? You do—often using your dog's name, or your birthday, or...are you seeing a weakness? Further, the certificate is installed on your computer—what if you're using someone else's computer? Somehow you still need to access your certificate, or install it from the certificate authority on the machine you're temporarily using—either setting a 1-day expiration (so the next person can't use it tomorrow) or deleting it when you're done. On public computers, however, you often can't download and install things because security programs prevent the installation of programs to protect them from being downloaded from the Net. This is, of course, exactly what you're doing.

The infrastructure required for public key encryption systems and the life cycle of a user's public key certificate pose challenges to scale and human nature that no purely technological solution can address. It is tempting to let the white horse of technology rescue us from otherwise complex security problems. Being so lulled into complacency, we become increasingly at risk. Where are the dangers?

A short list of the vulnerable spots in the PKI infrastructure include:

(1) *Issuance.* Authenticating the user. This is not a technical issue but a social problem associated with verifying the user's identity by non-technical means.

(2) *Validation.* Authenticating the CA. Is the source of the certificate real

continued on page 39

REFERENCES

The PKI Page
http://www.pki-page.org/ **Last accessed Feb. 25th, 2004.**

An Introduction to Public Key Infrastructure
http://www.articsoft.com/wp_pki_intro.htm

PKI Applications in Academic Computing,
http://ww.cs.dartmouth.edu/~pkilab/acapps.shtml, last modified July 17th, 2001. **Last accessed Feb. 27th, 2004.**

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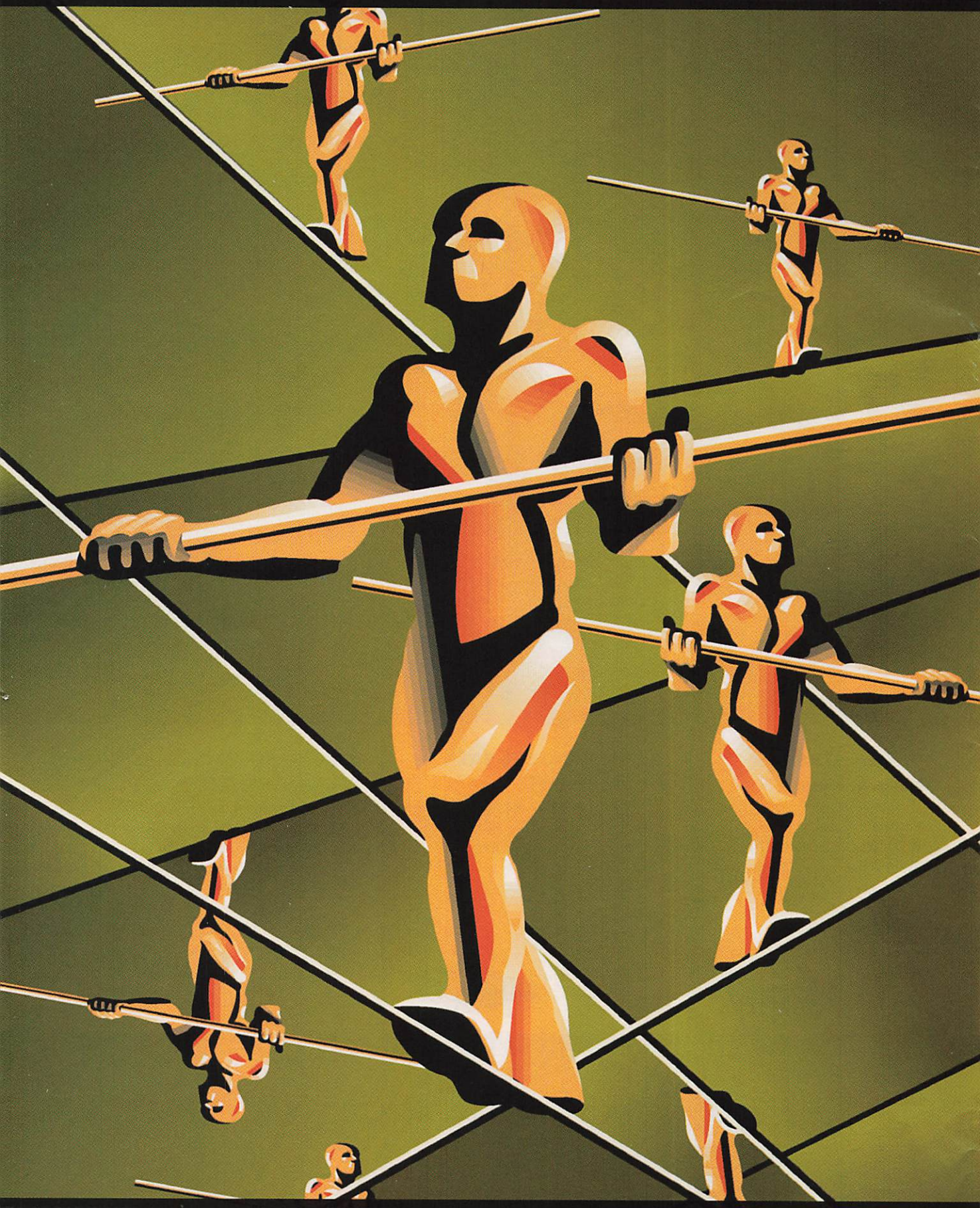

A Balancing Act?

OPENESS AND SECURITY ON CAMPUS

MIT's network manager and security strategist Jeff Schiller comments about security on today's campus networks.

Syllabus: How do you balance the demand for today's higher levels of security with the traditional openness of the higher education computing environment?

Jeff Schiller: You're making an assumption that openness and security are on opposite ends of the spectrum and that you have to choose between them. If you look at the security problems we have today, they're in fact not due to the openness of the network. They're due to the software that people run.

S: Do you mean the end-user software?

JS: Yes. I mean basically every computer connected to the Internet. Put another way, you should not depend on the network to provide protection for your computer.

S: What about the firewalls and network security software?

JS: The firewall was never an integral part of the Internet architecture. Firewalls developed because end-host software wasn't secure. A lot of software, particularly on PCs, was designed in the days before networks. It was designed to run on personal computer hardware that was not very sophisticated when the PC first appeared. So, putting protections into end user software is difficult. Then add to that various marketing pressures...for years security was simply not a priority. When you went to vendors, Microsoft and others, and said, "You should be putting some time and effort into making sure the software is not buggy as all-get-out," the answer was, "Well, we promised we'd ship by Friday, and you know, this is Internet time. We've got to get this stuff out there—nobody cares about security anyway."

And so, with that kind of history, firewalls got developed because quite frankly, the network managers were told to "do something," and that's the kind of thing you can do. But don't mistake that to mean that the only way to have a secure network is to have a network that is restricted or closed.

S: Do you really think it's possible to design a personal computer operating system to handle the security issues that now require firewalls and other complex network security measures?
JS: Yes. You own a Macintosh. How often does your computer crash?

S: Very rarely.
JS: The reason it doesn't crash all that often is because system software developers took some time and effort to make that the case. If they would take the time and effort to make it be secure, it would be secure.

S: So what is keeping that from happening?
JS: Some people have said that the problem is we don't have normal product liability laws with software. Now, if you buy an automobile and pieces fall off as you're driving out of the parking lot, the onus is on the dealer to make good. If you buy a toaster and it breaks, it's the manufacturer's problem to fix it. But you buy software, and the license says, "We're granting you a right to use this software, but if it doesn't work, or if it destroys all of your property or your career, we owe you nothing."

S: So there are no strong warranties with software...
JS: Well, they may say, "We warrant that the CDs the software comes on are made of plastic and they won't physically crack in the first 30 days."

S: Right!
JS: Now, the problem is that if you decide to put liability upon software authors, you destroy open source—because those people can't tolerate any liability. So, if I were king, I would rule that if you're selling software then you bear a certain liability; but if you're giving it away in open source, then you don't.

But, I fear that the commercial interests in this game, if they felt that Congress was backing them into a situation where they would have to accept liability, my guess is they would strenuously lobby that liability applies to everything, including open source, in an attempt to kill off open source. So that's the conundrum.

S: How would it work then, if the commercial software authors were liable and the creators of open source were not?
JS: Open source is a fundamentally different thing. With open source, if there's a problem I can fix it as the consumer. Obviously I have to have the skills to do that, but I do have the ability—the access—to do it. With closed source I don't. I'm literally at the mercy of the vendor to fix it.

S: But realistically, is that happening? Do all the people who are running Linux boxes have better security, or add in better security?
JS: I think Linux is much more secure than a lot of the other stuff that's out there, because so many people look at the source code—not everyone looks at it, but enough people do, so that problems get fixed earlier, rather than later.

S: What are the major security risks in the higher education environment that network users face from viruses and worms, and, given all that you've just mentioned about end-user systems being weak, what are the most reasonable protections?
JS: One of the things universities have is legions of students with poorly managed computers that don't have patches installed, and those machines are likely to be compromised by any of the worms that are running around the network right now. That's one view of it.

Another view is the risk to administrative data. Situations vary a little bit from institution to institution, but one problem is that administrators use the same type of poorly managed PCs that the students use. If they put sensitive information on those desktops, it can be compromised. But exactly how at-risk each institution is depends a lot on how it manages data and what its various policies are.

I would also go somewhat out on a limb and say that the more sophisticated research-oriented universities are probably in deeper trouble.

S: Why would that be?
JS: Speaking as a network manager at an institution with Nobel laureates, it's harder for me to set policy and make it

Jeff Schiller

Jeffrey Schiller is Network Manager at MIT and has managed the MIT Campus Computer Network since its inception in 1984. Prior to his work with the Network Group he maintained MIT's Multics timesharing system during the timeframe of the ArpaNet TCP/IP conversion. Schiller is an author of MIT's Kerberos Authentication system. From 1994 through 2003 he was the Internet Engineering Steering Group's (IESG) Area Director for Security, responsible for overseeing security-related Working Groups of the Internet Engineering Task Force (IETF). He was responsible for releasing a U.S. legal freeware version of the popular PGP encryption program.

Schiller is also responsible for the development and deployment of an X.509-based Public Key Infrastructure (PKI) at MIT. He was the technical lead for the Higher Education Certifying Authority operated by the Corporation for Research and Educational Networking (CREN) from 1999 until 2003. Schiller is a founding member of the Steering Group of the New England Academic and Research Network (NEARnet). NEARnet, now part of Level3, is a major nationwide Internet Service Provider.

SONY

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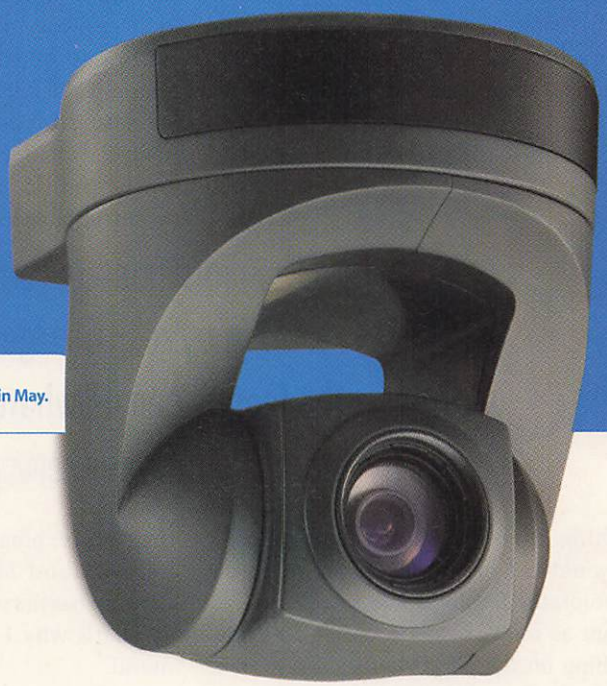

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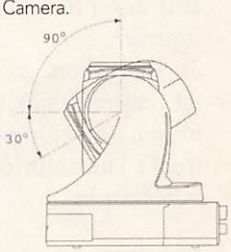

Take advantage of its new ceiling-mount capability, with the E:Flip function that electronically inverts the image. Take control of a wider 340-degree pan range, a wider 120-degree tilt range and a wider 18x optical zoom range—for an even closer, more precise approach to remote shooting.

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stick. The more famous your faculty, the more they're in charge. And the more the faculty can do whatever they want, the more chaotic your network's going to be.

S: So how do you manage that—do you have a firewall?

JS: People have often asked me, "Could you firewall MIT?" And, you know, I don't want to and I think it's the wrong thing. Even if I wanted to, my faculty would not permit me. Or more to the point, the faculty would say, "Yes, sure," but as soon as they couldn't do something on the network, they'd say, "Take out the firewall" or "Put in an exception so I can do what I want to." Firewalls that are filled with holes because somebody wants to do something quickly become useless.

"The more famous your faculty, the more they're in charge. And the more the faculty can do whatever they want, the more chaotic your network's going to be."

S: If not a firewall, then what is your strategy?

JS: There is one good technique, and it's the only one that's effective. No firewall, no port blocking—none of that will work. The solution is that *you must install patches.*

S: Patches for each and every PC, then...

JS: If you own a PC, you must install patches. You must pay attention. And, and if you're running a more modern version of Windows, things like automatic update can help. I'm going to give Microsoft some credit there. They've tried to make the installation of patches as painless as possible. But it's still something that you have to sign up for.

I might add, by the way, firewalls don't protect you against these worms. Because once a worm gets on the other side of the firewall, then the firewall's useless. For example, at one point the State Department's visa processing system got one of the worms. And you can guess there's a big firewall between that and the Internet. In fact, I'd be willing to bet that thing is not even connected to the Internet. And yet one of the worms got through to it. Probably by somebody taking a laptop, connecting it to the public Internet, catching the worm, unplugging the laptop, coming to their office, plugging it into the secure network and *boom,* now the secure network has the worm.

That's why I say firewalls are not useful.

S: What about attacks specifically directed at the network itself?

JS: Well, the only worms we've seen that have "hurt the network" do so by creating so much traffic that the network gets overloaded.

There have been occasional distributed denial of service attacks against network infrastructure. About a year or two ago there was an attack against several of the root servers. Since then the root, DNS servers have been hardened. They're actually a lot harder to attack now than they were then. It's amazing we have to learn these lessons one at a time. Now, there is a lot of attention to protecting the infrastructure of the Internet itself against attack. I'm less concerned about this than I was a year ago.

S: I wanted to ask about the state of encryption technology—the safety of data going over the network.

JS: Encryption technology, and sometimes ciphers are out there—the cipher du jour. People should either be using what's called triple DES, the data encryption standard applied three times over in a subtle way, or AES, the Advanced Encryption Standard that NIST sponsored that has been out a few years. Encryption is not the problem. Getting it deployed into actual products is where the challenge remains, and how to do that in a way that mere mortals can handle. There are places where encryption has been so successful you don't even know it's there. The classic example is HTTPS on the Web.

Go to any major eCommerce site—where you enter your credit card number, that transaction is encrypted. And you don't even have to put a lot of effort into worrying about how that's happening. You see the little lock icon, and you're good. So there's an example of where encryption has been very, very successful.

S: Where could it be used more effectively?

JS: A place where it's not been very successful, and where we could really use it in certain applications has been e-mail. There have been several attempts to try to do encrypted e-mail. The protocols are designed. There are many systems out there, but they're just a little too hard to use for the average person, so they don't tend to get used very much. We could really use some innovation to get encrypted e-mail up and running.

S: What would be the most needed or most useful applications of encryption on campus?

JS: Any time you're going to send sensitive information over the network you want to encrypt it. For example, at MIT our students and their advisors can look at grades online. We made sure that they use a Web-based application with HTTPS so that we are covered with the encryption.

And in fact, a real benefit in the education space is that the more things you can offer as Web services, the easier it is to provide security.

SONY

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The BRC-300 joins Sony's EVI-D70 with E:Flip function, the ultra-compact EVI-D100 and the Ethernet-ready SNC-RZ30N. All of which make Sony the automatic choice in robotic cameras.

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S: So it seems like institutions that have Web-based portals could certainly take advantage of HTTPS.

JS: If the portal software supports secure connections, yes, they can. Now, there's a subtlety here. Just because you encrypt the information going over the network does not mean that you can run insecure software on the servers.

Because of the widespread use of encryption on the Web, we don't have people stealing credit card numbers by intercepting Web traffic and decrypting it, because that's too hard. Instead, they break into the actual servers and steal thousands of credit card numbers—or lots of other data—at once.

So the important thing to remember about putting sensitive information on the Web is that you have to make sure the Web server software you're using is secure and up to the task. I don't want to say, "Oh, use the portal; you're fine," because I suspect that there's probably a lot of portal software out there that's not particularly secure.

S: Are there any other weaknesses to keep in mind, particularly when accessing data on the Web?

JS: This gets into engineering implementations. The devil is in the details. Let me give you an example. There's a Web site out there—I won't identify them—that offers survey services. You can set up surveys and revisit them to see the data collected or to edit them. But if you look closely at the actual URL in the little bar at the top of your browser, you will see some long number.

A few of us wanted to know, "Well, wonder what happens if we go into that title bar there where the URL is and just add *one* to that number?" And we did so, and all of a sudden we were looking at somebody else's survey, and seeing their answers. The devil is in the details.

S: What's being done on campuses to protect student privacy and to comply with FERPA?

JS: Well, FERPA covers what we're supposed to do, but it does not specify the level of protection you have to provide. It basically just says you're supposed to protect student records and not willingly give them away to the wrong people. But it doesn't really go into what the standard is and how much protection should be offered. I'm sure the protection is different at different schools.

The biggest threat to student records is how your administration is set up. Universities are at risk if they let administrators with insecure machines download sensitive data and leave it on their hard drive. Some worm could come along and actually mail it out.

I mean, a lot of people, when you talk about security for administrative data, they'll immediately say, "Well, you know, our registrar's database is protected this way, that way, and the other way." And you say, "Well, that's all well and good, but where does that data go?" In fact, there's an interesting conundrum here though it's not as bad as the one I talked about before. This one's about human nature.

You will have a situation where the administration will protect the data, and they'll say, "Well, we're going to only allow authorized representatives of the registrar's office to get to the registrar's data." Kind of makes sense, right? And then a researcher comes along and says, "Well, in order to do my research, I need this much information about these students."

And what would happen is, rather than giving the researcher access to the actual database where the data resides, someone will extract the data for the researcher and e-mail it to them on a spreadsheet. Chances are, it sits on the hard drive of the researcher and probably sits on the hard drive of the person who did the work for the researcher. So, in an attempt to restrict who can get at the data we wind up with the data getting splattered everywhere.

S: So education is a part of this?

JS: Education is a part of this, both for the people who own personal computers and work with the data and for the people running these systems. If somebody is eventually going to get the data [legitimately], maybe you would like to grant them access in the place where the data resides and simply say to them, "Don't keep copies of this on your hard drive."

> **"There's a need for security but that doesn't mean we sacrifice openess to get it"**

But if they can't get to the data themselves they're much, much more likely to keep a copy on their hard drives, once you e-mail them a copy. Because they think it will be very hard to get another copy.

S: So who's going to educate the users?

JS: Well, it's a slow process. I think when a school gets burned they tend to have a lot of running around in-house and they try to figure out how it happened, and then everybody gets security-conscious for a year or so... before they go back to their old habits. One of the fundamental problems is that security is very hard. And what makes it hard is that it's a negative deliverable. You really don't know when you have it. You only find out belatedly when you've lost it.

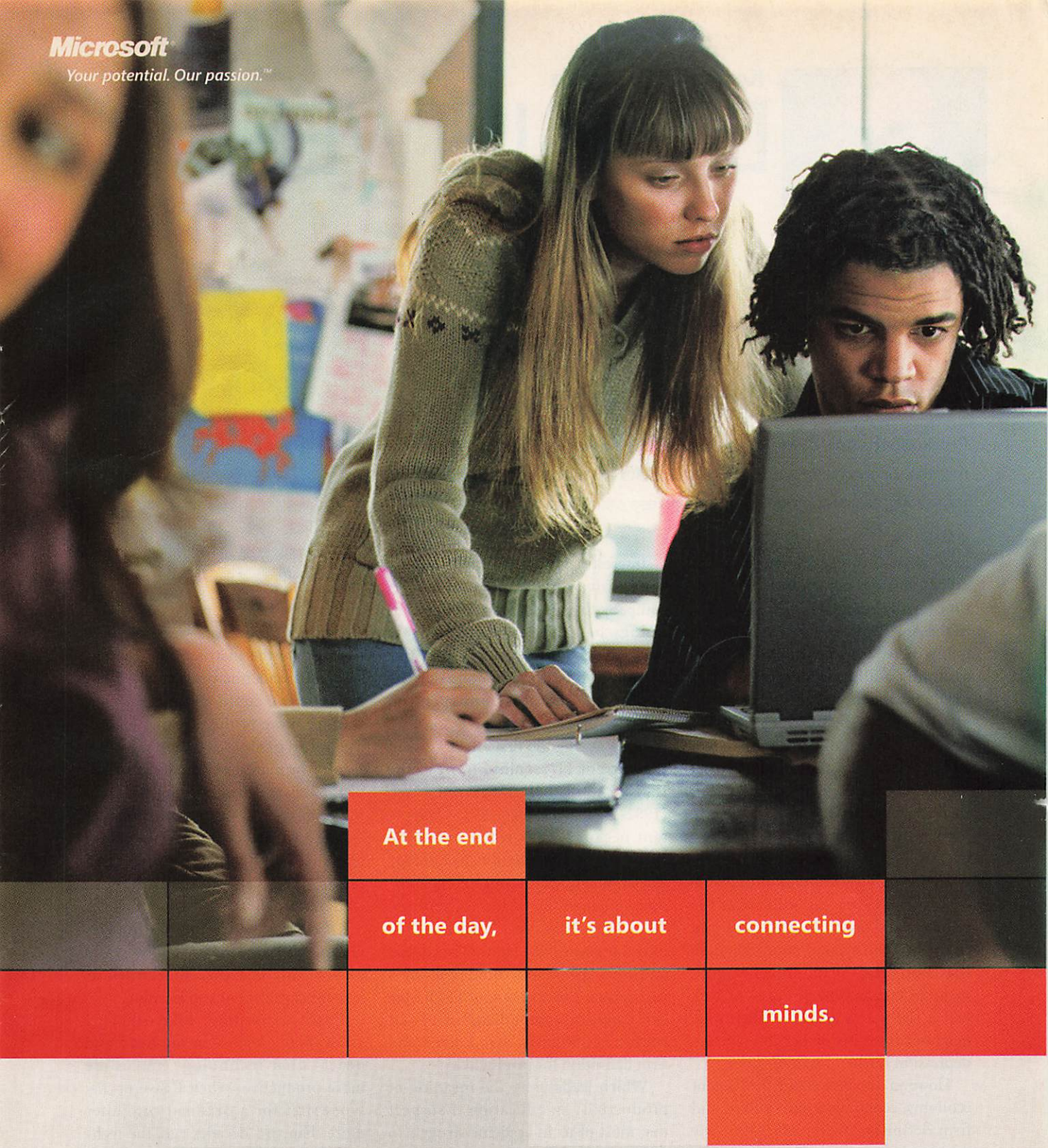
S: So getting back to the original question about openness versus the need for high security...

JS: I don't think it's either-or. There's a need for security but that doesn't mean we sacrifice openness to get it.

S: So would you say that you need a balance of both?

JS: Yes, you need a balance of both.

[***Editor's note:*** *Jeff Schiller will give a keynote at the Syllabus2004 summer conference, to be held in San Francisco, July 18-22.*]



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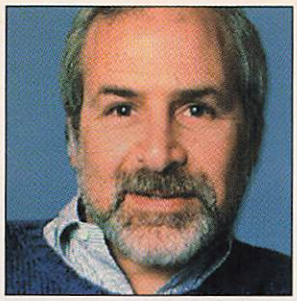

Kenneth C. Green

DIGITAL TWEED

To Epiphany—and Beyond!

Productivity has been in the news a lot over the past few months. Economists, politicians, and pundits all cite productivity as the leading factor contributing to the jobless economic recovery.

Illustration by Graye Smith

Read beyond the headlines and technology emerges as the official explanation for the recent productivity gains in the American economy. Admittedly, many of us are working longer and assuming additional responsibilities for no increment in pay. But our extra efforts notwithstanding, Federal Reserve Chairman Alan Greenspan and other sage observers tell us that the current productivity gains reflect, in part, returns for the corporate investment in information technology over the past two decades.

In this political season it is probably best to let politicians argue over the numbers and nuances of recession and recovery. Then again, I always thought that Ronald Reagan, an economics major at Eureka College (Class of '32), had it right: a recession is when your neighbor loses his or her job, while a depression is when you lose yours.

However you feel about the current economy, economists have a fixed and firm definition for productivity. My daughter's econ text offers this definition: "the amount of product produced by each unit of capital or labor." Technology, we know, contributes to productivity because it enables us to produce more or better products or services at a constant or reduced cost, i.e., with fewer "units of capital or labor."

Interestingly, it took a long time for Greenspan and company to find evidence of the technology bang for all the corporate bucks spent on IT over the past two decades. For example, consider the billions that corporations spent on desktop computers, software, and training during the first 10-12 years of the current IT revolution, from the IBM PC to the beginnings of the Web (1982-1994). The year 1994 is important because that's when corporate spending on information technology finally surpassed corporate expenditures on manufacturing technology. Yet it took more than a decade, well into the late 1990s, before Greenspan and other economists could proclaim a real return on investment (ROI) for the corporate spending on IT. Of course, economists have a fixed and firm definition for productivity.

Which leads us to the meaning of productivity in education. I suspect that most of us in academe struggle to define productivity for our sector of the economy. We generally prefer not to view our work in terms of inputs, outputs, or products. Ours is a true profession, a calling if you will. We may "produce" knowledge, scholarship, and instruction, but we don't manufacture these "products" and typically resent any effort to categorize our work in this manner.

In economic terms we know how to improve the instructional dimensions of "academic productivity." For example, we could contain salaries, transfer more of the teaching load to assistant professors or part-time faculty, or increase class size. By definition, any of these strategies would make academe "more productive" because we are changing (reducing) the ratio of inputs (capital and labor) to outputs (number of students taught).

Of course, these simple strategies fail to address complex quality issues or key outcome measures, such as student engagement and learning.

Enter technology. Like others, I know, *really know*—in my head and heart—that technology makes me more productive. When I gave up my typewriter for a personal computer more than two decades ago, the technology provided a competitive advantage: I could write (and rewrite) papers and proposals, create graphics, develop and update project budgets, and prepare conference materials better and faster than without the computer, and better and faster than my peers who did not use a computer.

continued on page 39

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Annie Stunden

CAMPUS ENTERPRISE

The Enterprise Quilt

The enterprise computing environment on campus is a complex fabric of diverse elements, stitched in layers.

When we think about enterprise computing, we tend to think only about replacements for legacy administrative systems. But the enterprise is much more than that; it is all of the computing resources together that we put in place to support our university.

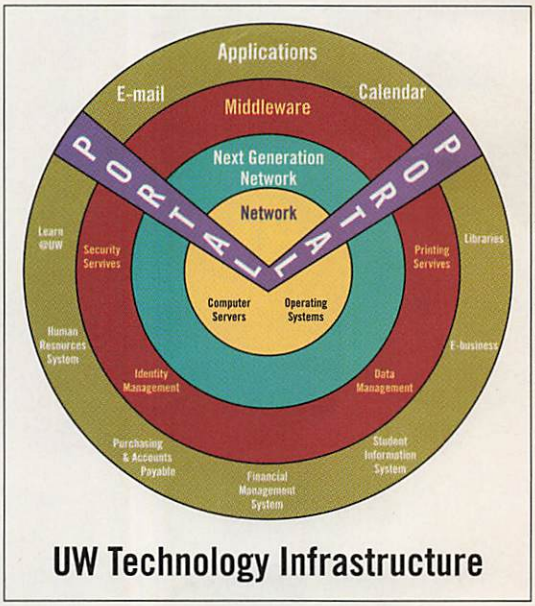
On our campus at the University of Wisconsin-Madison, we talk about layers of computing and networking technology as underwear, middleware, and outerwear (the UMO model). The UMO is a simple model. It does not begin to account for the multiple sublayers that make up this one layer or the components of those sublayers.

For example, when we start to parse our network—as we have recently done at Madison—we find ourselves soon facing streets and conduits and fibre (multi-mode or single-mode), buildings with cable (or maybe more fibre) between the floors and in the walls, telecommunications closets requiring specific electrical and HVAC capacity, access control for those closets, and equipment racks in those closets. Then there are the switches and routers in the closets connected by cable or fibre to wall jacks and then to desktop computers that require the correct network capability. And that's a simple picture.

We have networks in our computer rooms that are even more complex, where we worry about different layers in the network protocol. As we were building our new network I found myself remembering that TCP/IP is, in itself, a seven-layer protocol—I remembered this because we were struggling with a Layer 4 switch. And that's just the network.

The other large pieces of underwear are the central and distributed computers. Others are the servers and the operating systems that reside on them, a layer that has become very involved. There was a time when we had a mainframe that ran most of our legacy applications and another mainframe or maybe a VAX cluster that ran our academic applications. On mid-sized and large campuses these often resided in two separate computing centers—the administrative computing center and the academic computing center—and never the twain shall meet.

But meet they have. Now if there is a mainframe, it is one of many servers sitting in the computing center supporting an expanded portfolio of applications. At Madison we currently have over 400 centrally supported servers and many different operating systems. While not all of these 400 are technically "enterprise servers"—some of them provide more limited departmental support—all of them support either the entire enterprise or essential components of it. The enterprise computing environment is an extraordinarily detailed and diverse fabric—an enterprise quilt. As we develop more applications in the outer layers, we ask more from the underlying layers and more from our staffs that are keeping this environment running 24x7.



UW Technology Infrastructure

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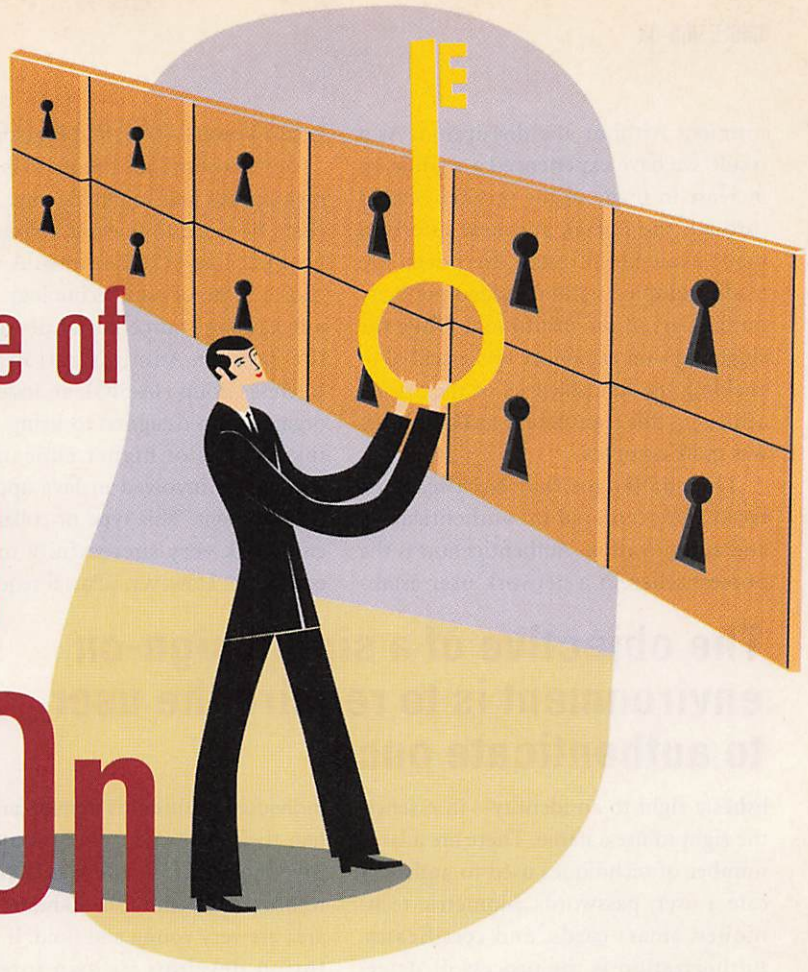
I favor the principle of keeping things short and simple (KISS), as we work on providing applications and services to support our university enterprise. Regardless, the technology environment continues to evolve and expand.

We face a very real challenge in managing this environment and in having our colleagues in the academe understand both how complex and how fragile the enterprise technology environment is.

Annie Stunden (stunden@wisc.edu) is chief information officer and director of the Division of Information Technology (DoIT) at the University of Wisconsin-Madison.



The Challenge of Single Sign-On

Maintaining security with a single sign-on through a Web portal is often a complex problem, especially in a college or university environment, where roles often overlap or change. Here, Rick Mickool reflects on the issues Northeastern University faced in its implementation of a single sign-on.

By Rick Mickool, Northeastern University

Like many higher education institutions, Northeastern has realized great progress in making information and electronic services available on the Web to our community members. However, simply Web-enabling our systems did not bring about the level of ease of use we wanted to achieve. For example, information that a student needs for routine curricular and co-curricular support resides in disparate systems including registration, e-mail, library, financial aid, and many others. Before we implemented single sign-on, accessing the information in each system required a separate authentication and authorization scheme. This required users to log in and out of multiple systems, and remember a variety of usernames, passwords, and even URLs. This was a cumbersome and frustrating process. Even worse, the dissatisfying experience often dissuaded our constituents from using the new services that Northeastern was promoting.

To overcome these issues, Northeastern implemented a portal with single sign-on capability. Today, our portal presents users with a single point of entry to a rich array of information and services, including administrative tasks like registering and paying for courses, and accessing course management systems for online learning. The complexities required by the separate systems are handled behind the scenes and are no longer the burden of the end user. Also, the common look, feel, and navigation of the single sign-on environment make it easier for users to find what they are looking for in the portal. These capabilities have greatly increased the ease of access and the breadth of services readily available to the Northeastern community. As new services are Web-enabled, they are presented to users within this familiar envi-

Illustration by Stephanie Wunderlich

ronment without any disruption. As a result, we have experienced a significant increase in usage of the services offered through the portal, and new offerings made available through the portal are readily adopted without added publicity on the part of the institution. While the single sign-on capability was essential to enabling the full potential of the portal, achieving this transparent level for users was quite complex.

The challenges that Northeastern faced were centered on authentication and authorization. Authentication is the process wherein a network user establishes a right to an identity—in essence, the right to use a name. There are a large number of techniques used to authenticate a user: passwords, biometric techniques, smart cards, and certificates. Authorization is the process of determining whether an identity—plus a set of attributes associated with that identity—is permitted to perform some action, such as accessing a resource.

The objective of a single sign-on environment is to require the user to authenticate once.

Authentication

The objective of a single sign-on environment is to require the user to authenticate only once. Enabling this requires an integration framework that allows single sign-on authentication throughout all the systems and applications—which are from a multitude of vendors—that are incorporated into the portal environment. Because this area of authentication is still in its infancy and without set standards, Northeastern chose to purchase a vendor solution, SCT Luminis, whose platform infrastructure features provide this integration framework. SCT Luminis has pre-built "connectors" for integrating many common higher education systems into the portal environment. Institutions also can create custom connectors. Northeastern has used the connectors to integrate with Lotus Domino, IBM Websphere, CollegeBoard PowerFAIDS, and Blackboard.

Some institutions choose to build their own portals and minimize their software costs by not purchasing a commercial product like SCT Luminis. A popular choice is the uPortal technology which is a free, open source portal developed by the Java in Administration Special Interest Group (JA-SIG), an independent organization designed to bring together institutions of higher education and companies involved in Java application development. This type of collaboration can work very successfully in higher education. However, uPortal requires that individual institutions develop and maintain their own integration protocols—an investment of considerable time and resources. In addition, standards in this area are very young and fluid. If an institution develops its own integration protocol, it must be prepared to dedicate the resources necessary to stay abreast of any changes.

We chose a vendor solution because we do not have the staff expertise to properly implement an open source solution. We also wanted a vendor to support the integration, and to continue to build on, and take advantage of, emerging standards. In addition, selecting SCT Luminis does not preclude us from taking advantage of the uPortal collaboration initiatives since Luminis uses, and SCT contributes to, many of the uPortal specifications.

However, even integrating with a vendor solution requires upfront research on the part of the IT staff to effectively plan the integration effort. An institution needs to become familiar with the strengths and weaknesses of the integration framework that they purchase or build. Staff must learn about potential integration requirements based on the authentication method of an institution's various applications and plan an optimized approach to integration. Frankly, some of your applications might not work with your authentication method. In these cases, you will have to negotiate with the vendor of the individual application alter their solution. Otherwise, your institution will need to alter your integration framework to adapt to the vendor.

We found forums like EDUCAUSE and Internet2 very helpful to our research efforts. Our commitment to supporting industry standards like LDAP and SAML helped to minimize these integration challenges. Once the initial research is complete, institutions should begin building the individual connections, constantly making more and more applications available to users with a single sign-on over time, rather than introducing a great number of new offerings once or twice a year. At Northeastern, this approach keeps our portal content fresh and continually increases the value of our investment while limiting the risks of introducing too many complex changes at one time.

Authorization

Single sign-on authenticates the user to the system and verifies that the person is presenting the right set of credentials, allowing the individual onto the electronic campus. Now that they are "on campus," you need a means to present to them everything that they should have access to—and nothing more. This is the authorization process.

One of the most complex issues Northeastern addressed in this area was defining and mapping service offerings to the appropriate user. For example, recent graduates are provided with access to grades, transcripts, and e-mail for one year after they graduate. However, other services, like registering online for a course or viewing a financial aid award, must be terminated immediately upon graduation. When you consider all the services and information the university makes available, and the different requirements for establishment of an individual's authorization level, you quickly begin to appreciate the complexity. In addition, those requirements often change.

Continued on page 41

CONFERENCE BROCHURE

Syllabus 2004

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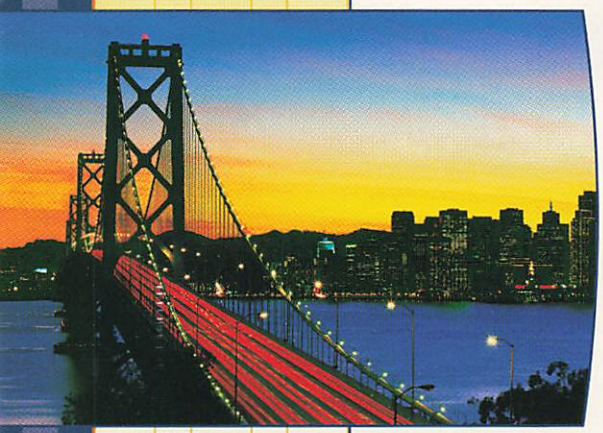

KEYNOTE SPEAKERS

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Network Manager, MIT Security Architect,
MIT's Information Technology Architecture Group

JOEL SMITH, PH.D.
Vice Provost and Chief Information Officer,
Computing Services, Carnegie Mellon University

ANNIE STUNDEN
Chief Information Officer and Director, Division of
Information Technology, University of Wisconsin, Madison

CONFERENCE HIGHLIGHTS

- A day at UC Berkeley exploring innovative learning technologies, emerging modes of teaching and collaborative computing environments
- Expert panels and thought leaders with diverse viewpoints on IT's hot topics
- A collegial setting for exchanging information and networking with peers

Sather Gate, UC Berkeley
Photo by Steve McConnell, UC Berkeley

101communications

REGISTER TODAY: WWW.SYLLABUS.COM/SUMMER2004

Top Reasons to Attend

Best Practices

Many of the presentations at the conference demonstrate campus technology innovations that have been successfully implemented. You will benefit from a week-long virtual case study lab — information sure to generate new ideas you can use right away.

Peer-to-Peer Learning

Breakout, panel and poster sessions at Syllabus2004 are developed and presented by your peers—faculty, administrators and IT professionals who are passionate about the role that technology can play in the delivery and management of higher education.

Day at UC Berkeley

This one day alone is reason enough to put Syllabus2004 on your professional development "must do" list. Through tours, presentations and classroom instruction, you'll get an insider's look at UC Berkeley's efforts in innovative learning technologies, emerging modes of teaching, collaborative computing environments, and distance learning technologies.

Industry Trends

What's next and why? Conference keynotes and expert panels give you a chance to interact with and gain insight from campus technology leaders and visionaries. You'll get the future perspective you need to act wisely.

Networking

You are not alone! Syllabus2004 is a community where you have access to hundreds of highly-motivated education professionals from large universities to small community colleges, from across the country and around the world. It's your chance to add new contacts to your network.

Collegial Environment

The Syllabus conference model is unlike other events where the pace is hectic and the interpersonal opportunities are few and far between. That's why so many of our attendees return year after year. They enjoy the collegial atmosphere and appreciate the easy access to presenters and vendor representatives.

Hands-On IT Solutions

The Syllabus2004 Exhibit Hall is a valuable complement to the conference program. Here is where you'll find top vendors eager to help you find the best practical solutions to your IT challenges.

Who Should Attend

- **CIOs, Provosts, VPs, and IT directors** involved in strategic and enterprise-level technology decision making
- **Directors of academic computing** who want to implement systems that will foster the highest academic standards and practices
- **IT professionals** who must maintain mission-critical applications on campus
- **Heads of administrative computing departments** who provide key information services throughout the campus
- **Faculty** who want to take advantage of the latest technology for teaching and learning
- **Department chairs** responsible for providing faculty development

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It's time to make your plans to attend Syllabus2004, this year's annual summer conference in northern California.

We have an outstanding lineup of keynotes, featured panels, sessions, and seminars, each contributing to a comprehensive program that provides many opportunities to learn, explore, and exchange information with peers.

Conference speakers and attendees at Syllabus conferences represent a wealth of knowledge and information in the unique realm of higher education technology. More than 125 speakers have joined the conference faculty, presenting topics relevant to the five tracks you'll find listed on page 5. Each track is carefully constructed to provide a wide range of presentations that reflect the latest technologies, trends, and practices on college and university campuses.

We're excited to announce a full-day excursion to the University of California, Berkeley, on Monday, July 19. There, you'll have a chance to see applications of technology in action and interact with technology leaders on campus. For details on our day at UC Berkeley, please see pages 8 and 9.

Syllabus2004 promises to offer five thought-provoking days, as well as a collegial environment for learning and professional growth. It's an opportunity we think you'll find both exciting and valuable. I look forward to seeing you there.

Mary Grush

Mary Grush — Editor and Conference Program Director

KEYNOTES

MONDAY, JULY 19

8:30 – 9:30am

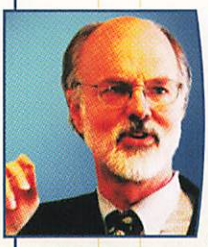
DIGITAL LEARNING CULTURES IN THE INFORMATION LANDSCAPE

Clifford A. Lynch, Ph.D. — Executive Director, Coalition for Networked Information (CNI) & Adjunct Professor, University of California, Berkeley

A number of distinct cultures have evolved concerned with the various aspects of IT-enabled learning: "Learning objects" and the repositories that aggregate them are well established; "Learning management systems" (sometimes called "course management systems" or "virtual learning environments") operate on very different levels of abstraction; the entire evolving infrastructure of digital collections, digital libraries and institutional and disciplinary repositories are now struggling to formulate appropriate linkages with the world of digitally-enabled learning; and, finally, the additional perspectives of scholarly communication and records management are demanding recognition. Lynch will examine these sometimes-competing and conflicting points of view and sketch the developing linkages and relationships among them. He will discuss both the prospects for an effective synthesis of these different perspectives and some of the questions that we need to answer in pursuit of such a synthesis.

TUESDAY, JULY 20

8:30 – 9:45am



COGNITIVELY INFORMED ONLINE COURSE DESIGN

Joel Smith, Ph.D. — Vice Provost and Chief Information Officer for Computing Services, Carnegie Mellon University

Many challenges remain in the delivery of effective technology-enhanced learning in higher education. To realize the potential of web-supported learning environments, it will be necessary to make dramatic changes in course development, informed by relevant findings of contemporary cognitive science and learning theory. Digital learning environments can be instrumented to provide multiple, rich feedback loops to students, instructors, and designers. These efforts should be supported and sustained through promotion of cohesive communities of use that represent a more powerful "scholarship of teaching" with online tools. Smith will present these principles in light of his extensive research and work with Carnegie Mellon University's Open Learning Initiative (OLI), a new approach to making web-based courses openly available to any individual learner.

WEDNESDAY, JULY 21

8:30 – 9:45am

CAN THE INTERNET SURVIVE?

Jeffrey Schiller — Network Manager, MIT

The Internet was originally designed to permit people to use computers that were far away from them. However it quickly evolved into a powerful means of communication between people. Today, a true "Peer to Peer" network has developed, one on which anyone can communicate with anyone else and everyone may publish or consume information. But that network is under attack. Viruses, worms and the scourge of spam have compromised its nature and put its very existence at risk. The easiest solutions for dealing with these threats could in the end destroy the core values and essence of the network. Schiller will consider better, though more difficult, strategies for securing the continuing usefulness and effectiveness of the Internet.

THURSDAY, JULY 22

8:30 – 9:45am

WANDERING THE TECHNOLOGY UNIVERSE

Annie Stunden — Chief Information Officer and Director, Division of Information Technology, University of Wisconsin, Madison

Take a trip with Annie Stunden from the core of the technology infrastructure to some of the places on the outer edges of our technology universe as we know it today and can envision it in the next year or two. Stunden will talk about building the base that we wander from and where we might meander as we support our students, faculty and staff. She will also talk about some of the perils we encounter and some of the wonders we find as we explore real possibilities and make them our own.

General Session Panels

Tuesday, July 20 — 4:30 – 5:30pm

Panel: Pushing Technology into the Background—Services for Useful Collaborations

Moderator: William H. Riffee, Ph.D. — Associate Provost for Distance, Continuing and Executive Education, University of Florida

The "gee whiz" factor is gone from the transmission and display of data bits, as well it should be. Today's students can rightfully expect technology to serve their needs effectively and unobtrusively. What are the collaborative tools and services your institution should offer, and how can these applications now operate ubiquitously in the background—behind the walls and in the air? This panel will discuss their views on evolving technologies and services—including collaboration technologies and resource services such as music and film elements. Which systems and services will influence instructional delivery most in the years to come? Together, the panelists will predict a timeline for development and adoption of next-generation collaboration tools.

Panelists:

Lonnie Harvel — Director, Computer Enhanced Educational Services, Georgia Institute of Technology

William Griswold, Ph.D. — Professor, Department of Computer Science & Engineering, University of California, San Diego

Lois Brooks — Director, Academic Computing, Stanford University

Wednesday, July 21 — 5:00 – 6:00pm

Panel: Your Campus and the TEACH ACT: Scenarios and Services

Moderator: Judith Boettcher, Ph.D. — Consultant, Designing for Learning & University of Florida

Come to this session with your questions and suggestions about offering courses online, in view of the TEACH ACT. This panel of experts provides program scenarios and guidelines to help in interpreting the provisions of the Act, including the criterion for e-reserves and also how to cultivate a campus environment that supports faculty and staff knowledge about this important legislation.

Panelists:

Laura Gasaway, J.D. — Director, Law Library & Professor of Law, University of North Carolina, Chapel Hill

John Harwood, Ph.D. — Senior Director, Center for Education Technology Services, Penn State University

Thursday, July 22 — 11:15am – 12:30pm

Evolution and Innovation in User Support

Moderator: Howard Strauss — Manager, Technology Outreach, Princeton University

Help! There is a growing menagerie of wireless intelligent devices including laptops, PDAs, Blackberry devices, and PDA cell phones on which users expect Web page delivery, email, and the full suite of university applications. Traditional four-year resident students have become the exception rather than the rule. Software has become more complex and varied. Once it was enough to be able to browse the Web; now users need to publish multimedia on it. Technological and social changes are radically transforming user support needs. How should IT organizations provide support in this new environment?

Panelists:

Farhat (Meena) J. Lakhavani — Director of User & Educational Services, Computing Services, Carnegie Mellon University

Ricky Telg, Ph.D. — Associate Professor, Agricultural Education and Communication, University of Florida

Mark Veljkov, Ph.D. — Executive Director of Learning, City University OnLine

Track Descriptions & At-A-Glance

Track Descriptions

In five conference tracks, we examine the central themes and key technologies that have become increasingly critical to technology decision makers in higher education. More than 125 presenters from colleges and universities across the U.S. will share their expertise, findings, anecdotes, and strategies for implementing and/or improving technology across the campus environment.

New Technologies & Trends

From handheld computers to ePortfolios, and new high-tech tools for instruction, this track samples the new and emerging technologies and applications that make a difference in the development and delivery of education.

Join us as we investigate the trends that are taking hold on campus and technologies that are changing the way we work, learn, and collaborate.

Interactive Media

Today's interactive media allow educators the flexibility to offer new modes of teaching and collaborative learning. See how these technologies are being used in the classroom, lab, and for distance education, and learn more about the enabling technologies and standards like SMIL, XML and SCORM that help to make it all possible.

Streaming technologies, Web casting, and interactive Web sites are being leveraged for efficient and effective content delivery, especially with new tools that make interactive media more accessible than ever before.

IT Implementation and Support

Today's technology implementations are no longer isolated within departments or single courses, but are more often enterprise strategies touching multiple constituents, campus wide. A broad user base requires user support, and successful implementations of technology include evaluation and support strategies along with planning for integration with enterprise systems. Learn what institutions are doing to support faculty development, evaluate technology programs, provide help desk services, and offer resources for technology integration.

Strategic Planning/Administrative Issues

Strategic planning may involve a myriad of challenges, from network and infrastructure issues to distance learning program development. Concerns may include how to determine return on technology investment, or how to plan for current and future waves of technology, portals, and learning management systems.

Teaching with Technology

This track offers a faculty view of the intersection of technology and pedagogy. Instructional design can spark changes that influence widespread program redesign. Join colleagues as they discuss new models of learning, present case studies, and explore relevant topics including instructional design standards, technology and student learning, and more.

At-A-Glance

Sunday, July 18, 2004

9:00 - 10:30am	S1, S2, S3, S4 or S5
10:45am - 12:15pm	S1 cont., S2 cont., S3 cont., S6 or S7
12:15 - 1:30pm	Lunch
1:30 - 4:30pm	S1 cont., S8, S9, S10 or S11

Monday, July 19, 2004

8:30 - 9:30am	**Keynote: Clifford A. Lynch, Ph.D., Coalition for Networked Information and UC Berkeley**
9:30 - 10:45am	Buses to UC Berkeley - 9:35, 9:45, 10:00am
10:45 - 11:05am	**UC Berkeley Overview: Paul Gray, Ph.D., UC Berkeley**
11:05 - 11:45am	**Keynote: Kristine Hafner, Ph.D., University of California, Office of the President**
11:45am - 1:00pm	Lunch
1:00 - 2:00pm	M1, M2, M3, M4, M5 or UC Berkeley Self-Guided Tour
2:15 - 3:15pm	M6, M7, M8, M9, M10 or UC Berkeley Self-Guided Tour
3:30 - 4:45pm	**Panel: Moderated by Victor Edmonds, Ph.D., UC Berkeley**
4:30 - 6:00pm	Buses return to Hyatt Regency — 4:30, 5:30, 5:45 and 6:00pm

Tuesday, July 20, 2004

8:30 - 9:45am	**Keynote: Joel Smith, Ph.D., Carnegie Mellon University**
10:00 - 11:30am	T1, T2, T3, T4 or T5
11:30am - 2:00pm	Exhibit Hall Open & Lunch
11:30am - 12:30pm	Poster Sessions
12:30 - 1:15pm	Matchware Technology Classroom
1:20 - 1:45pm	TechSmith Technology Classroom
2:00 - 3:00pm	T6, T7, T8, T9 or T10
3:15 - 4:15pm	T11, T12, T13, T14 or T15
4:30 - 5:30pm	**Panel: Moderated by William H. Riffee, Ph.D., University of Florida**
5:30 - 7:00pm	Exhibit Hall Reception

Wednesday, July 21, 2004

8:30 - 9:45am	**Keynote: Jeffrey Schiller, MIT**
10:00 - 11:30am	W1, W2, W3, W4 or W5
11:30am - 2:45pm	Exhibit Hall Open and Lunch
11:30am - 12:30pm	Poster Sessions
12:30 - 1:15pm	Matchware Technology Classroom
2:15pm	Exhibit Hall Raffle
2:30 - 3:30pm	W6, W7, W8, W9 or W10
3:45 - 4:45pm	W11, W12, W13, W14 or W15
5:00 - 6:00pm	**Panel: Moderated by Judith Boettcher, Ph.D., Designing for Learning**

Thursday, July 22, 2004

8:30 - 9:45am	**Keynote: Annie Stunden, University of Wisconsin, Madison**
10:00 - 11:00am	Th1, Th2, Th3, Th4 or Th5
11:15am - 12:30pm	**Panel: Moderated by Howard Strauss, Princeton University**

Sunday Seminars

Syllabus 2004

	Teaching with Technology	IT Implementation and Support	Strategic Planning/ Administrative Issues	New Technologies & Trends	Interactive Media
9:30am	S1 Instructional Design in the Web Space	S2 Planning for Faculty Development: Integrating Instruction with Technology	S3 Cost Effective Redesign of High-Demand Courses	S4 Streaming Media Resources for Clinical Education	S5 Beyond a Look and Feel: An Aesthetic of Engagement
10:30 am / 10:45 am				S6 Communication and Collaboration in Online Courses Using Macromedia Flash	S7 Database Delivery of Learning Materials
12:15pm / 1:30 pm		S8 Applying Desktop Recording Software for Meaningful Staff Development	S9 Virtual Values: Building Communities Online	S10 XML — An Emerging Technology for Education	S11 Virtual Interactive Communities
4:30pm					

S1 Instructional Design in the Web Space

9:00am – 12:15pm & 1:30pm – 4:30pm — Full Day

Judith Boettcher, Ph.D. — Consultant, Designing for Learning

This seminar is an opportunity for faculty and administrators to explore the key issues of designing and managing online and distance learning programs. It addresses the foundations of instructional design and development, steps in preparing courses and learning experiences for the Web space and strategies for managing administrative challenges including cost, time, and infrastructure needs for online learning. Participants are encouraged to bring hot topics of their own, such as faculty workload, assessment, and intellectual property issues.

S2 Planning for Faculty Development: Integrating Instruction with Technology

9:00am – 12:15pm — Half Day

Gayle Burns — Director, Faculty Academic Technology Support Center, California State University, Los Angeles

Henryk Marcinkiewicz, Ph.D. — Founding Director, Center for Teaching, Learning & Faculty Development, Ferris State University

A model for implementing a faculty development program will be described. The goals are integrating instruction with technology and professional development. The model is based on systems planning and draws together learning factors and implementation strategies. Participants will discuss the feasibility of this initiative by considering the assessment of key environmental conditions. During the second half, participants will draft implementation plans.

S3 Cost Effective Redesign of High-Demand Courses

9:00am – 12:15pm — Half Day

Roger Von Holzen, Ph.D. — Director, Center for Information Technology in Education, Northwest Missouri State University

Andrew White, Ph.D. — Director, Educational Technologies, University of Missouri, Columbia

Darla Runyon — Assistant Director and Curriculum Design Specialist, Center for Information Technology in Education, Northwest Missouri State University

Matthew Livengood — Instructional Design Coordinator, Center for Information Technology in Education, University of Missouri, Columbia

This workshop will provide details about the low-cost, but successful, redesign process undertaken by Northwest Missouri State University, including close examination of example projects. The key topics of this workshop — program marketing, financial considerations, course design issues, course templates, assessment strategies, and course management issues — will supply the participants with the necessary questions, ideas and resources that they may draw upon when they return to their institutions and implement their own redesign processes.

S4 Creating and Using Streaming Media Resources for Clinical Education

9:00 – 10:30am

W. Wayne Young, Pharm.D. — Director, Academic Development and Technology Center, Creighton University Medical Center

Robert McQuillan, M.D. — Chairman, Anesthesiology Department, Creighton University Medical Center

Time constrained medical students, residents and practicing physicians require a flexible anytime, anywhere educational delivery system so that their opportunity to participate in medical education programs and activities can be maximized for each individual. Multimedia clinical presentations can be delivered on demand to medical clerkship students and residents using current audio and video streaming technologies within campus intranets. This session will describe the creation, delivery and rationale for on-demand clinical education streaming media.

S5 Beyond a Look and Feel: An Aesthetic of Engagement

9:00 – 10:30am

Tony Brock — Assistant Professor Graphic Design, North Carolina State University, College of Design

Design — interactive, graphic, or motion — is recognized as something one should have, but its formal languages and history are rarely the point of substantive discussion in the creation of distance education media. As educators move into the next generation of delivering their courses through screen-based media, the history of visual design must be explored beyond the surface and used to explain complexity and nuance in ways that exploit the media to the fullest.

S6 Communication and Collaboration in Online Courses Using Macromedia Flash

10:45am – 12:15pm

Brian Klaas — Senior Systems Designer, Johns Hopkins Bloomberg School of Public Health

Macromedia's Flash plug-in is much more than a tool for pretty animations: it's also a powerful platform for communication and collaboration between faculty and students. This presentation will provide an overview of the possibilities for communication and collaboration using the Flash plug-in, the Flash Communication Server and Flash Remoting. Key considerations for both development and deployment will be discussed to help ensure smooth integration of Flash-based communication applications into your e-learning initiatives.

S7 Database Delivery of Learning Materials

10:45am – 12:15pm

Robert W. Cavenagh, Ed.D. — Director of Instructional Technology, Dickinson College

Todd Bryant — Language Technologist, Dickinson College

David S. Kelly — Assistant Director of Instructional Technology, Dickinson College

Brenda Landis — Multimedia Programmer, Dickinson College

Paul M. Levit — Executive Director, Information Technology, Dickinson College

Call it image management, content management, digital asset management, or some other variation on that theme, but database delivery has become the new sine qua non of instructional support. The presenters, from Dickinson College, reviewed several good commercial and open source products—among them, Luna Insight, MDID, ContendDM, and Fedora—and were able to craft their own solution that deals with images and an array of formats. This seminar will examine the necessary decision processes and model Dickinson's current solutions.

S8 Applying Desktop Recording Software for Meaningful Staff Development

1:30 – 4:30pm

Li-Ling Chen, Ph.D. — Assistant Professor, California State University, Hayward

Fabio Fernandes — Multimedia Designer, California State University, Hayward

Cris Fernandes — Multimedia Designer, California State University, Hayward

Judy Silva — Graphic Designer, California State University, Hayward

How can you deliver meaningful technology training for staff and faculty in your schools? Come and join this classroom style, in-depth workshop that explores the hows and whys of a desktop recording software, Camtasia, to promote effective training.

S9 Virtual Values: Building Communities Online

1:30 – 4:30pm

Matt Wannan — Instructional Designer, University of Western Ontario

What do we value? How does learning with technology reshape our values? What can we understand about our virtual teams and ourselves by learning about group values? This session will appeal to all individuals who facilitate online discussion groups or build virtual communities of practice.

Participants in the session will better their understanding of the importance of using active learning experiences in distance studies courses. Discussion will be centered on methods of fostering effective online discussion groups. Through active participation, participants will build team-building skills applicable to the online learning environment. Participants will be challenged to think about how team values differ from individual values and how understanding team values can enhance the group experience and facilitate success in achieving goals and learning outcomes.

S10 XML — An Emerging Technology for Education

1:30 – 4:30pm

Frank Coyle, Ph.D. — Director, Software Engineering Program, Southern Methodist University

Since XML's approval by the W3C in 1998, XML has significantly changed the computing landscape. Numerous XML-based languages have emerged in areas ranging from science and technology to business and the arts. For educators, XML is playing an increasingly important role in both content delivery and distance education.

In this session we'll explore XML — its origins, its structure and the family of XML support technologies that make new and exciting applications possible. We'll look at how Cascading Style Sheets (CSS), XHTML, SVG, and XQuery open up options for delivering XML to a variety of devices in different formats, and how the XML-based SMIL (the Synchronized Multimedia Integration Language) puts sophisticated multimedia presentation options into the hands of educators. We'll also take a look at SCORM, the Sharable Content Object Reference Model, designed to enable the reuse of Web-based learning content across multiple environments and products.

As XML initiatives continue to proliferate, it is imperative that educators understand what XML is and how they can best leverage it to meet their specific needs. Attendees will come away with a broad perspective of how XML-related standards work together to enable the delivery of real-world XML-based applications.

S11 Virtual Interactive Communities

1:30 – 4:30pm

Robert Cavalier, Ph.D. — Associate Teaching Professor, Department of Philosophy & Director, Multimedia Lab, Center for the Advancement for Applied Ethics, Carnegie Mellon University

The Internet from its very origins was a stimulus for a new kind of community. The text-based Bboards and Chat rooms of the 70s, 80s and early 90s have now evolved into the online forums web-based distance learning environments and a vast variety of Special Interest Groups. In this seminar we will explore the history and nature of virtual communities, with an emphasis on practical (though not overly technical) design and implementation issues. We will conclude with a look at next-generation environments for Computer-Mediated Communications and how these might be used improve the nation-based societies that give rise to virtual communities. I will draw on my own experiences as PI in an NSF-funded project called PICOLA (Public Informed Citizens On-line Assembly).

A Day at UC Berkeley

UC Berkeley Programming & Special Events

Syllabus2004 features a day of learning and exploration at one of the world's leading academic institutions, the University of California, Berkeley, on Monday, July 19.

The Berkeley campus is renowned for its libraries, laboratories, research, and publications, as well as the distinction of its faculty and students. The faculty includes eight Nobel Laureates, 124 members of the National Academy of Sciences, 19 MacArthur Fellows, 81 Fulbright Scholars, three Pulitzer Prize winners and more Guggenheim Fellows (138) than any other university in the country.

Included in your registration (see page 14 for details), this special day on campus affords you the opportunity to see and experience the latest education technology in action, as well as hear from some of the leading scholars on technology in higher education.

Following Monday's keynote address on *Digital Learning Cultures* by Clifford A. Lynch, Ph.D., Executive Director, Coalition for Networked Information (CNI) and Adjunct Professor at UC Berkeley, the conference moves to the UC Berkeley campus. Paul Gray, Ph.D., Executive Vice Chancellor and Provost of UC Berkeley will give us an overview of Berkeley and some of their programs, followed by Kristine Hafner, Ph.D., Associate Vice President, Information Resources and Communication, University of California, Office of the President, with a special on-campus keynote. That afternoon you will have the opportunity to participate in a variety of sessions led by UC Berkeley faculty or take a self-guided tour of the campus. This will be an active day on campus, so comfortable shoes are the order of the day.

MLK Student Union, UC Berkeley
Photos by Steve McConnell, UC Berkeley

Keynote

UC's Turbulent Times and the Role of IT

Kristine Hafner, Ph.D. - Associate Vice President, Information Resources and Communication, University of California, Office of the President

Dr. Hafner will discuss Information Technology's role in the University of California's roller coaster ride through budget and growth ups and downs since the year 2000. She will also discuss the New Business Architecture report, "UC 2010: A New Business Architecture for the University of California" (http://www.uc2010.ucsd.edu), and how it has guided campus and system-wide IT-related initiatives. Hafner will conclude by reviewing some of the strategic IT-related issues that will likely confront the University of California in the next several years.

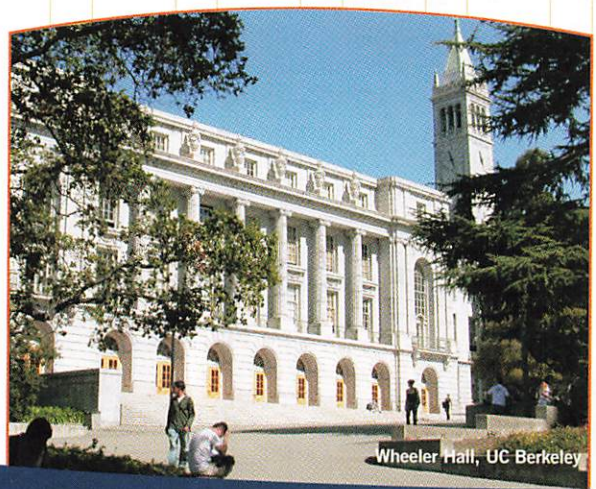
Panel Discussion

Is Open Source in Your CMS's Future?

As course management systems have matured, they've encompassed wider functionality and integrated with numerous other campus systems. As with most large, complex systems, the unbundling of service and software components may produce greater opportunities for efficiencies and customization. Open source efforts in general, and specifically Sakai, may be the wave of the future for CMS. Join this interactive panel of experts to discuss the key issues surrounding open source CMS.

Panelists: Charles Kerns, Stanford University
Phillip D. Long, Ph.D., MIT
Kathy Christoph, University of Wisconsin, Madison
Brad Wheeler, Ph.D., Indiana University
Mara Hancock, University of California, Berkeley

Moderator: Victor Edmonds, Ph.D. — Director, Educational Technology Services, University of California, Berkeley



Wheeler Hall, UC Berkeley

Schedule for the Day at UC Berkeley

10:45am — **Welcome and UC Berkeley Overview**

Paul Gray, Ph.D. — Executive Vice Chancellor and Provost, University of California, Berkeley

11:05am — **Keynote**

Kristine Hafner, Ph.D. — Associate Vice President, Information Resources and Communication, University of California, Office of the President

11:45am — **Lunch in Pauley Ballroom**

12:45pm — **1:00pm** — **Self-Guided Campus Tour or Sessions:**

Teaching with Technology	IT Implementation and Support	Strategic Planning/ Administrative Issues	New Technologies & Trends	Interactive Media
M1 Document Engineering Robert Glushko – University of California, Berkeley	**M2 Teaching within a PRISM: Presentation, Replay, and Interaction with Streaming Media** Mark Kubinec, Ph.D. — University of California, Berkeley	**M3 Technology Training for Faculty: Meeting Diverse Needs** Judith Stern —University of California, Berkeley Karen Miles — University of California, Berkeley	**M4 Interpreting a Strategic Plan: Negotiations between Institution and Marketplace Needs** Muriel Dance — University of California, Berkeley	**M5 Initial Findings on Use of Digital Collections in Humanities and Social Science Undergraduate Teaching** Diane Harley — University of California, Berkeley Alison J. Head — University of California, Berkeley

2:00pm — **2:15pm** — **Self-Guided Campus Tour or Sessions:**

M6 Cultural Heritage Information: The Role of Place (GIS) and Time in Teaching Lewis R. Lancaster, Ph.D. — Hsilai University & University of California, Berkeley	**M7 Berkeley's Art, Technology, and Culture Colloquium and its Center for New Media** Ken Goldberg, Ph.D. – University of California, Berkeley	**M8 Digital Image Services Come of Age (But Will They Ever Grow Up?)** Laine Farley – University of California Office of the President	**M9 An Introduction to CITRIS, the Center for Information Technology Research in the Interest of Society** Gary L. Baldwin, Ph.D. — University of California, Berkeley	**M10 Recent Initiatives in Faculty Development: The Thrill of Victory and the Agony of Defeat** Barbara Gross Davis, Ph.D. — University of California, Berkeley

3:15pm — **3:30pm** — **Panel: Open Source CMS**

Moderator: Victor Edmonds, Ph.D. – Director, Educational Technology Services, University of California, Berkeley

4:45pm — **4:30pm** — **Buses return to San Francisco Hyatt Regency**

6:00pm

Concurrent Session Schedule

		New Technologies & Trends	Interactive Media
Tuesday, July 20	10:00am	**T1 The New Information Frontier—The Personalized Portal** Bruce M. Taggart, Ph.D., Lehigh Univ. Timothy Foley, Ed.D., Lehigh Univ.	**T2 Motion Research-Collaboration Studio in the MFA in Design and Technology at Parsons School of Design** Anezka Sebek, Parsons School of Design Andrew Baron, Parsons School of Design
	11:30am 2:00pm	**T6 Panel: PDAs in Heath Care Education** **Panelists:** Lynda Davidson, Ph.D., Robert Morris Univ. Lynn George, Ph.D., Robert Morris Univ. Laura Marcial, Johns Hopkins Med. School Sharon McAvinue, Johns Hopkins Med. School Nicole Sokol, Johns Hopkins Med. School **Moderator:** William H. Riffee, Ph.D., Univ. of Florida	**T7 Web-Enabled Databases for Everyone** Jonathan Maybaum, Ph.D., Univ. of Michigan
	3:00pm 3:15pm	**T11 Panel: ePortfolios for Program Assessment** **Panelists:** Margaret Crisham, Ed.D., Dowling College Thomas Kelly, Ph.D., Dowling College Rebecca Lawson, Lansing Comm. College Charles Rudiger, Ed.D., Dowling College **Moderator:** Trent Batson, Ph.D., Univ. of Rhode Island	**T12 Comparative Analysis of Classroom Interaction in Three Learning Contexts: Traditional Class, Hybrid Class, and Online Class** David L. Strickland, East Georgia College Carol Cornwell, Georgia Southern Univ.
Wednesday, July 21	4:15pm 10:00am	**W1 Panel: Personal Information Technologies** **Panelists:** J. David Betts, Ph.D., Univ. of Arizona Graham Glynn, Ph.D., Penn State Univ. & Learning Management Systems Stuart J. Glogoff, Univ. of Arizona **Moderator:** Howard Strauss, Princeton	**W2 Research with Worldwide Reach: A Case Study in Harvard Zoology Museum's Online Database** Gary D. Alpert, Ph.D., Harvard
	11:30am 2:30pm	**W6 Panel: Media Capture and Successful Distance Education** **Panelists:** James Dias, Sonic Foundry Dalton Kehoe, Ph.D., York Univ. Kelly Parke, York Univ. Amy Pate, Thunderbird **Moderator:** William H. Riffee, Ph.D., Univ. of Florida	**W7 Panel: Learning Objects: Development, Delivery and Repositories** **Panelists:** Jeff Larson, Broward Community College Scott Strand, Bethel Seminary Darla Runyon, Northwest Missouri State Univ. Roger Von Holzen, Ph.D., Northwest Missouri State Univ. **Moderator:** Frank Tansey, Ph.D., Merritt Group
	3:30pm 3:45pm	**W11 Creating a New Learning Environment: the University of Georgia Student Learning Center** William K. Jackson, Ed.D., Univ. of Georgia	**W12 What?! Classroom Lectures and Activities Can Be Interactive and Fun?** Robert P. Fons, Univ. of Kentucky College of Medicine Jeffrey J. Cain, Univ. of Kentucky College of Pharmacy
Thursday, July 22	4:45pm 10:00am	**TH1 Panel: Teaching Online and CMS Alternatives** **Panelists:** Benjamin Archibald, Nicenet Nathan Dintenfass, Nicenet Luke Fernandez, Ph.D., Weber State Univ. Todd Blake Finley, Ph.D., East Carolina Univ. **Moderator:** Judith Boettcher, Ph.D., Designing for Learning	**TH2 Panel: eBooks and Digital Course Materials** **Panelists:** Barry W. Birnbaum, Ed.D., Northeastern Illinois Univ. Laurie Godwin, East Carolina Univ. Dorothy Howse Clayton, Ph.D., East Carolina Univ. Joyce Joines Newman, East Carolina Univ. Mike Sharkey, Univ. of Phoenix **Moderator:** Frank Tansey, Ph.D., Merritt Group
	11:30am		

IT Implementation and Support	Strategic Planning/ Administrative Issues	Teaching with Technology
T3 Panel: Faculty Development **Panelists:** Vicki Casella, Ph.D., SF State Univ. Christine Des Jarlais, Ed.D., UC San Francisco Renee Jones-Welch, Ph.D., Univ. of Illinois, Chicago Kevin Kelly, SF State Univ. Bruce Macher, Ph.D., SF State Univ. Kate Pravera, Ph.D., Univ. of Illinois, Chicago **Moderator:** Gayle Burns, Ph.D., CSU, Los Angeles	**T4 Near Synchronous Teaching: Combining Community and Low-Bandwidth** Curt Madison, Ph.D., Univ. of Alaska	**T5 Principles, Practice, Polish & Portfolio: A New Approach To Learning Technology** Sharon Wily, Valencia Community College
T8 Developing and Delivering an Online Faculty Institute in Teaching and Learning Carol Leppa, Ph.D., Univ. of Washington, Bothell Andreas Brockhaus, Univ. of Washington, Bothell Julie Planchon Wolf, Univ. of Washington, Bothell	**T9 How Globalization Has Impacted Strategies for Campus Networking** Brian Voss, Indiana Univ.	**T10 Panel: Problem-Based Learning** **Panelists:** Lisa Anderson, Intern'l Acad. of Design & Technology Thomas Mitchell, Ph.D., Southern Illinois Univ., Carbondale Mai Neo, Multimedia Univ., Cyberjava, Malaysia Chitra Subramaniam, Intern'l Acad. of Design & Technology **Moderator:** Judith Boettcher, Ph.D., Designing for Learning
T13 Managing Wireless Authentication and Access on Campus Jay Field, Sonoma State Univ. Jim Noonan, Sonoma State Univ.	**T14 Coordinating a distance learning software rollout with the needs and visions of a mature test organization — political and technical lessons learned** Luke Fernandez, Ph.D., Weber State Univ.	**T15 A Collaborative University Team Develops a Web-Based Course for the Government** Penelope Semrau, Ph.D., CSU, Los Angeles Barbara A. Boyer, Ph. D., CSU, Los Angeles
W3 Roadmap to Effective Distance Education Instructional Design Erik Anderson, Ph.D., Univ. of Idaho Cheryl Bielema, Ph.D., Univ. of Missouri, St. Louis Kim Dooley, Ph.D., Texas A&M Univ. Ricky Telg, Ph.D., Univ. of Florida	**W4 Higher Education Technology, Teaching & Learning: View From Senior Administrators' Offices** Eric Bassett, Eduventures	**W5 Just What Do They Know? Assessing Student Technology Skills – A Case Study** Mary Beth Graham, Carroll Community College
W8 Look, No Wires! Wireless Online Testing Susan Anderson, Des Moines Univ. Juanita Robel, Des Moines Univ.	**W9 The Use of New Technologies in the Classroom in Chile and Spain – Some Technological and Multicultural Challenges** Ana Boa-Ventura, Univ. of Texas, Austin Claudia Engel, Ph.D., Stanford Adriana Gewerc, Ph.D., Univ. of Santiago de Compostela	**W10 Panel: Student Needs and Online Courses** **Panelists:** John Hickok, CSU, Fullerton Cindy Kenkel, Northwest Missouri State Univ. Rosemary McGill, CSU, Fullerton **Moderator:** Kathy Christoph, Univ. of Wisconsin, Madison
W13 Panel: Outsourcing – Build or Buy? **Panelists:** Jeffrey Jones, Univ. of Central Arkansas Jason LaMar, Ohio Wesleyan Univ. Aaron Thomason, Univ. of Central Arkansas **Moderator:** William H. Riffee, Ph.D., Univ. of Florida	**W14 Strategies for Bridging the Gap: Content and Resources** **Panelists:** Jerry Meisner, Ph.D., UNC, Greensboro James H. Stith, American Institute of Physics Debra Saunders White, Ph.D., Hampton Univ. **Moderator:** Judith Boettcher, Ph.D., Designing for Learning	**W15 Instructional Design That Fits Online** Randy Lee Stamm, Idaho State Univ. Bernadette Howlett, Idaho State Univ.
TH3 Linux for Public Workstations Perry Horner, Arizona State Univ.	**TH4 Panel: Defining & Growing Online Programs** **Panelists:** Sven Normann, Pharm.D., Univ. of Florida Gloria Pickar, Ed.D., Compass Knowledge Group Steve Stargardter, Ph.D., City Univ. Mark Veljkov, Ph.D., City Univ. OnLine Cynthia Wheatley, Ph.D., Compass Knowledge Group Donald Williams, Ph.D., Florida Hospital College of Health Sciences **Moderator:** Evan T. Robinson, Ph.D., Shenandoah Univ. School of Pharmacy	**TH5 Panel: Developing Effective Online Pedagogy** **Panelists:** Laura J. Evans, Ed.D., Roosevelt Univ. Karen Gersten, Ed.D., Roosevelt Univ. Claudia L. Johnston, Ph.D., Texas A&M Univ., Corpus Christi **Moderator:** William H. Riffee, Ph.D., Univ. of Florida

Exhibit Hall

The Syllabus2004 Exhibit Hall is where the conference community meets to see the latest products and services from technology vendors, as well as informal Poster Sessions on a variety of topics.

Schedule & Special Events

Tuesday, July 20

11:30am – 2:00pm	Exhibit Hall Open
11:30am – 12:30pm	Poster Sessions
12:30 – 1:15pm	Matchware Technology Classroom
1:20 – 1:45pm	TechSmith Technology Classroom
5:30 – 7:00pm	Exhibit Hall Reception

Wednesday, July 21

11:30am – 2:45pm	Exhibit Hall Open
11:30am – 12:30pm	Poster Sessions
12:30 – 1:15pm	Matchware Technology Classroom
2:15pm	Exhibit Hall Raffle

Poster Sessions

Always popular at Syllabus conferences, these sessions provide a detailed look at graphic presentations and papers on technology applications and best practices. Poster presenters will be on hand for Q&A and detailed informal discussion. Plans are for up to 25 poster sessions per day, located in the Exhibit Hall. Look for details on Syllabus2004 website at www.syllabus.com/summer2004.

Technology Classrooms

MatchWare — Tuesday 12:30 - 1:15pm

"Flash and Web Design Made Easy"

Participants will learn to create comprehensive Flash websites in a matter of minutes with interactive navigation, object animation and much more.

Mediator 7 is an icon-based authoring tool that lets you drag-and-drop your way to interactive websites, Flash presentations and multimedia CD-ROMs - no programming or experience is necessary.

Easy to use, with "One-click" exports to Flash and HTML, auto-rum CD-ROM and automated FTP upload allows students and teachers can focus on content rather than technology.

MatchWare — Wednesday 12:30 - 1:15pm

"Mind Mapping: Visual Learning and Thinking"

Brainstorm and expand on topics that will become the framework for written documents, presentations and class lectures.

Mind Maps help facilitate students' analytical thinking, comprehension, creativity and writing skills across the curriculum.

MatchWare OpenMind allows students and teachers to rapidly visualize, organize, and implement ideas and export them to HTML, Word, PowerPoint or MatchWare Mediator.

TechSmith — Tuesday 1:20 - 1:45pm

"Camtasia Studio and SnagIt — Create Learning on Demand!"

Stop by the TechSmith Technology Classroom to see SnagIt and Camtasia Studio in action! SnagIt and Camtasia Studio are the industry leading software applications for recording, capturing, and sharing anything you can see on your computer screen. Educators worldwide use TechSmith solutions to create software training tutorials, enhance and record PowerPoint presentations, whiteboard applications and much more! The session will include a brief overview of both applications, as well as some examples from other educators using the software. For more information please visit www.techsmith.com/edu.

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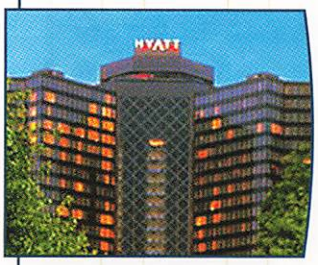

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Fax 1.415.398.2567

A special room rate of $159 single/double has been reserved for Syllabus2004 attendees. Attendees must book their accommodations by June 25, 2004, to receive the discount. After that date regular room rates will apply. Rooms at the special rate are available from July 16 through July 22, based on availability.

To make reservations, call 1.800.233.1234.

Parking

Valet parking is available at the hotel at a cost of $38 for overnight parking or $10 for the first hour and $5 for each additional half hour. In addition, there are four underground self-parking garages in Embarcadero Center. Daily maximum rate is $27.50; maps and directions to these garages can be found at http://www.embarcaderocenter.com/md/index_md.html#parking.

Shuttle Service & Directions

The hotel is 14 miles away from the San Francisco Airport (SFO), 19 miles away from the Oakland Airport (OAK) and 46 miles away from San Jose International Airport (SJO). Transportation will need to be arranged by shuttle, taxi, BART or rental car. For rental car, see the information on this page on discounts with AVIS. For all other transportation from SFO please visit www.flysfo.com/transport/services/gt_tsv_search.asp. For transportation from OAK please visit www.flyoakland.com/ground_transportation.shtml. For transportation from SJO please visit www.sjc.org/travelers/ground_trans.html.

Air Travel Discounts

American Airlines is offering discounts from any published domestic fare for travel to San Francisco between July 15 and July 25, 2004. Mileage members can receive full credit for all American miles flown to attend this conference. To take advantage of these discounts, please call toll-free, or have your travel agent call: American Airlines: 1.800.433.1790, reference number #A2574AF.

Southwest Airlines offers up to 10 percent off most fares for air travel to and from this event (Oakland or San Jose airports), with the convenience of Ticketless Travel. To qualify, call Southwest Airlines Group and Meetings Reservations at 1.800.433.5368 and reference I.D. Code #X0363. Reservations Sales Agents are available 7:00am- 8:00pm Monday-Friday, or 8:30am-5:30pm Saturday-Sunday (Central Standard Time).

Book early to receive the best discount.

Rental Car Discount

AVIS Rent-a-Car is offering a special discount on any size car rental for Syllabus2004 attendees. To receive the discounted daily and weekly rates, simply call AVIS at 1.800.331.1600 and use AVIS Worldwide Discount #D005872.

Attendee Networking

Interested in networking with other paid attendees? Then be sure to check the attendee networking box when you register. We will provide you and other registrants with the names, titles, companies and email addresses of fellow attendees so that you can communicate before and after the conference.

Weather and Dress

Temperatures inside the meeting rooms can vary greatly and are often cool so plan your attire accordingly. Dress for the conference is business casual. San Francisco and Berkeley have moderate temperatures in July with an average high of 84°F and an average low of 58°F. Rainfall during this time of year is an average of .06 inches or .2 millimeters.

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Registration Information

How to Register

Online: www.syllabus.com/summer2004

Phone: 1.800.280.6218 (8:00am – 5:00pm PST)

Fax: 1.541.346.3545 (credit card payment only)

Mail: Syllabus2004 Registration
1277 University of Oregon
Eugene, OR 97403-1277

On-site: You may register for the conference onsite. However space is limited and admission cannot be guaranteed.

Registration Deadlines

- Early Registration Discount Deadline June 18
- Regular Online Registration Deadline July 16
- After July 16, please register onsite. Registration will be limited to space available.

Group Packages & Discounts

When five or more people from a single company or organization register at the same time, you can realize great savings. Early bird savings apply! (See below for details.)

Refund & Cancellation Policy

A 100% refund less a $50 processing fee will be given for all cancellations requested before June 18. After June 18, no refunds will be given; however, all registrations are transferable to colleagues and associates with written authorization from the original registrant.

Registration Questions?

Phone: 1.800.280.6218 (8:00am – 5:00pm PST)

Email: syllabus@continue.uoregon.edu

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Syllabus2004's federal tax ID number is 95-4758348.
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To register your group, or for more information call Sara Ross at 1.949.413.5582.

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- ❑ Other IT products/services from 101communications
- ❑ Carefully selected outside companies

❑ Attendee Networking – yes, I want to participate (See page 13 for details)

Step 2 Choose Your Registration Package

Registration Packages	Early Bird Through June 18	Regular Through June 18
Gold (All 5 days)	$795	$995
Silver (Mon-Thur)	$645	$795
For Group Registrations, please Call Sara Ross at 1.949.413.5582		
Group 5 Pack* (Mon-Thurs)	$2,750	$3,500
Group 10 Pack* (Mon-Thurs)	$4,500	$6,000

*Sunday Seminars can be added for $100 per person

Total Fee $

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Step 3 Demographic Questions

Please tell us where you work:

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Please indicate your primary role:

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- ❑ IT Director / Manager — Academic Computing
- ❑ IT Director / Manager — Administrative Computing
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Step 4 Send in Your Registration

MAIL registration with full payment to:

Syllabus2004 Registration
1277 University of Oregon,
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or, if you use a credit card, **FAX** your registration to: 1.541.346.3545.

You may also register **ONLINE** through our secure Web site at

www.syllabus.com/summer2004.

If you would like to use a Purchase Order to register, please contact Dena Fisher, Conference Services Coordinator at 1.800.280.6218 or 1-541-346-3537 to make arrangements.

Step 5 Select Your Sessions Online

After receiving your confirmation code, you may go to the registration page at www.syllabus.com/summer2004 and enter your code. Then select the conference sessions and seminars that you are interested in attending. This will help us in planning logistics, however, it is not binding nor required.

Transfer/Cancellation Policy

You may substitute another person in your place any time prior to the event. If you must cancel, your fee will be returned, less a $50 cancellation fee, so long as your cancellation is in writing and postmarked no later than June 18, 2004. Cancellations made after June 18, as well as "no shows," are liable for the full registration fee.

Questions?

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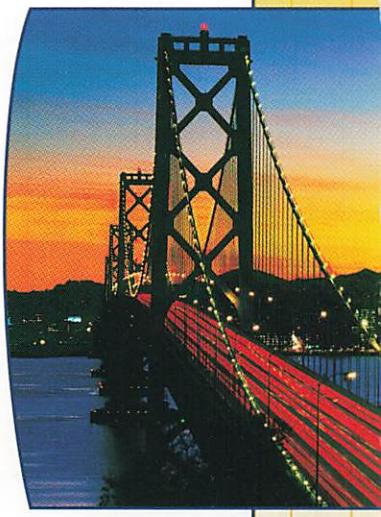

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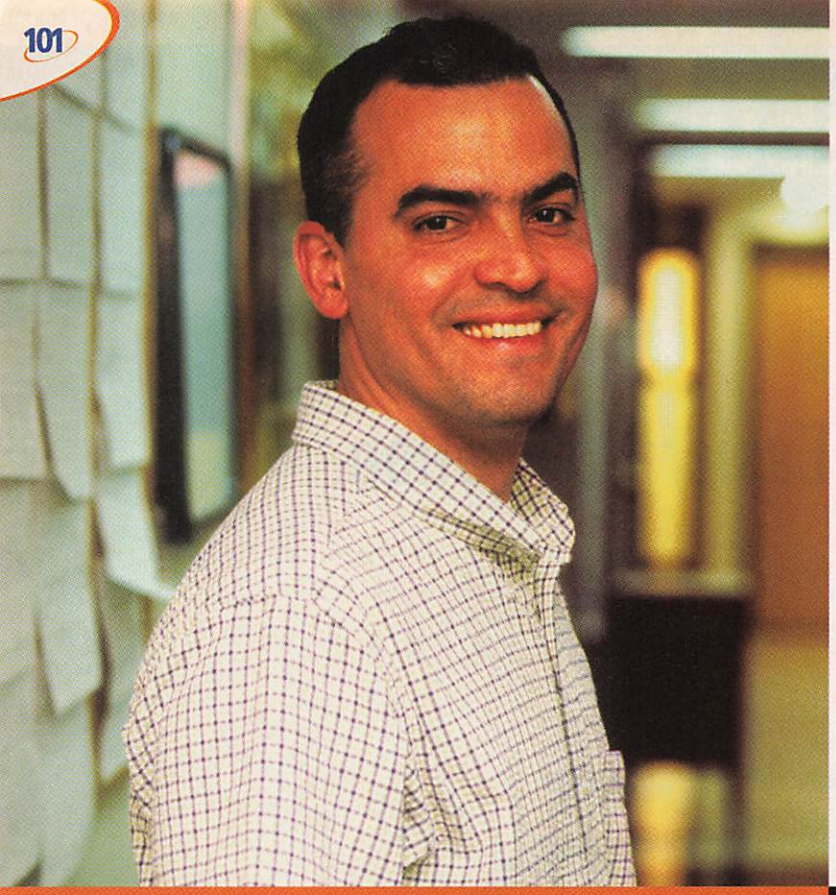

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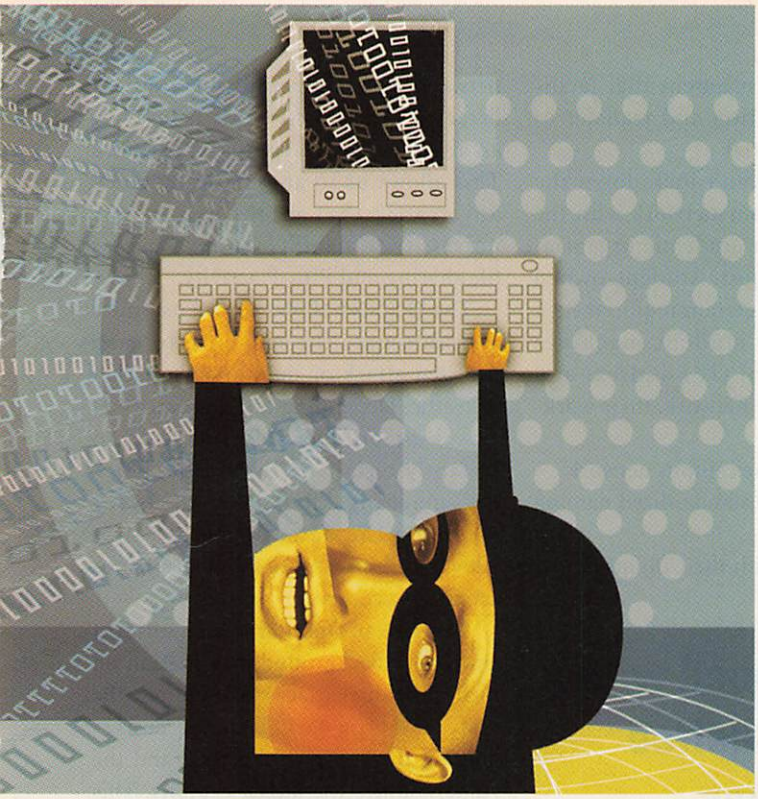

Illustration by William Rieser

Securing the Academic Network: Intrusion Prevention

By Susan F. Moyer, Susquehanna University

An academic network is one of the most difficult networks to secure and maintain. It must be open and accessible—much more so than networks in corporate, government, or private sectors. The academic network is designed to facilitate the flow of knowledge. Faculty and students must be able to pursue intellectual inquest with minimal restraint.

This poses a difficult dilemma for campus network administrators. The open nature of academic networks inevitably comes into conflict with the requirements of network security. Campus networks contain highly sensitive information—personnel and financial data on students and their families, academic and administrative records, and high-value research and intellectual property. Network administrators must find the balance point between open access and security.

Striking this balance is critical, but it's not the only security challenge campus IT departments face. Other high-priority issues include:

- *Liability.* The explosive growth of Peer-to-Peer (P-to-P) file sharing on campus has introduced significant security and liability concerns, most notably in the area of copyright infringement. P-to-P networks and file sharing have opened the door to charges of copyright violations and high-profile litigation. Student-launched network attacks also raise liability concerns. Campus IT departments must avoid being found complicit in enabling illegal student activity.
- *Distributed authority.* IT staff are directly responsible for information security, yet lack the authority to dictate security policies. Often each academic department creates its own access policies, yet the campus IT group typically bears ultimate responsibility for the security and functioning of the network. The IT group must operate in an environment of decentralized network authority, while maintaining centralized responsibility for the health of the network.
- *Budgets and bandwidth.* Growing demand for bandwidth continually strains budgets and resources. Shoestring IT budgets are the norm on college campuses. Yet the educational process is now dependent on the Internet. With wire-

less networks sprouting up in dormitories and P-to-P usage increasing exponentially, network management and bandwidth costs are on the rise.

- *Varied skill sets.* Campus IT staffs are overwhelmed with responsibilities and typically operate with limited resources and skill-sets. Students are often recruited to help ease the burden, but they may not have the requisite skills or depth of experience.

Maintaining the integrity and security of confidential information on the network, while allowing access to thousands or tens of thousands of users, creates unique problems for the campus IT staff and network administrators.

These challenges must be managed within an educational culture built on thefree exchange of information and ideas.

Network Security at Susquehanna

Susquehanna University is located in central Pennsylvania and serves a student body of approximately 1,800. We maintain 30 network servers (file servers, domain controllers, DHCP servers, etc.) with close to 3,000 endpoint workstations among students, faculty, and laboratories.

Security is one of the 14-person IT group's primary concerns. We undergo an extensive third-party audit every two years and continually update our network and policies based on the audit results. Although we have long relied on a firewall to provide basic perimeter security, a recent audit recommended implementing an intrusion detection system (IDS) to better monitor and respond to network attacks and other potentially harmful traffic.

Policies in Perspective

University policy prohibits all music and DVD sharing. This is solely driven by liability and copyright issues. The IT group simply can't be perceived as fostering an environment that facilitates the duplication and transfer of copyrighted material.

Although we can't lock down the workstations on our network with the same control non-academic organizations can, we require student-owned machines to meet certain requirements. Before we issue student machines Internet Protocol (IP) address and allow them on the network, their workstations must:

- Register on the campus network;
- Conform to a standardized naming convention;
- Provide us with their unique hardware address.

This gives us the ability to pinpoint any specific problems or suspicious activity and take appropriate action. We also periodically scan all workstations for malicious applications and services, such as hacking software. If any such programs are found, we terminate the network connection to the non-compliant machine.

Intrusion Detection and Prevention

Because we have very little control over student and faculty workstations, we maximize our usage of the firewall and IDS to secure the network. The IDS solution we implemented, StillSecure Border Guard, is both an IDS and an intrusion prevention system (IPS). The IPS features allow us to terminate harmful traffic before it enters or exits the network. It continuously monitors all traffic at our connection to the Internet and can instantaneously identify and terminate attacks and malicious traffic.

Like a firewall, the IDS/IPS system lets us create rules that govern the types of traffic permissible on the network. When impermissible traffic is detected, the system treats it just like an attack and takes appropriate action. This allows us to automatically block any traffic that might expose the university to liability claims, such as file sharing and P-to-P activity.

The IPS also allows us to customize and automate the response to each detected attack or questionable packet of traffic. Depending on the severity of attack or policy violation, we can instantly terminate the traffic, block the machine that is sending or receiving the data, or simply alert network administrators that suspicious activity is occurring.

The system maintains a significant amount of background information on each individual attack, for example, the systems being targeted, the consequences of a successful attack, and the vulnerabilities the attack exploits. This history is extremely beneficial for determining how we should respond to each attack—it gives us the information we need to make the right decision. Between our firewall and the IDS/IPS, we have been saved from the viruses and attacks that have brought other colleges in the area to their knees.

An Ongoing Battle

Educational institutions are in many respects at greater risk than other organizations. Their limited budgets and resources prohibit the implementation of adequate security measures. The decentralized and diverse nature of collegiate networks present complex IT challenges.

These challenges must be managed within an educational culture built on the free exchange of information and ideas. Successful IT solutions, like intrusion detection/prevention systems, offset stretched or insufficient resources by automating processes, reducing the workload, and increasing staff efficiency.

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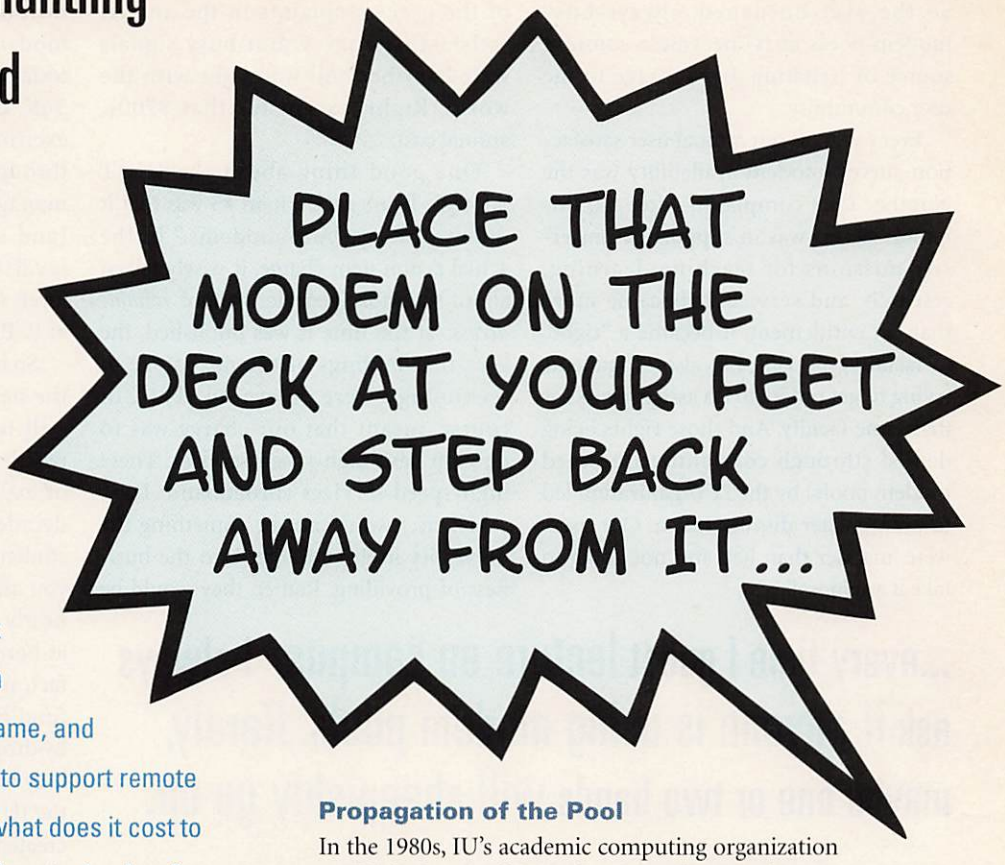
The case for dismantling modem pools, and especially not building new ones, in the 21st century

By Brian D. Voss, Indiana University



Access to the campus network and computing and information resources is the name of the game, and colleges and universities need to support remote access to their networks. But what does it cost to maintain outdated communications technology? Here, Brian Voss details why institutions should consider abandoning modem pools.

Recently, I've seen some inquiries from CIOs about the wisdom of installing dial-up modem lines at their institutions to serve student, faculty, and staff with off-campus access to their campus networks, and the Internet beyond. I thought for a moment I had been whisked back in time to the 1980s or early 1990s, but it appears that now in 2004, dinosaurs may still roam the earth.

Let me say up front for the record: I think establishing a modem pool in the 21st century is a bad, bad idea. I'm not sure it was ever a good idea. But I can understand how it might once have appeared a reasonable thing to do. Establishing a modem pool is sort of like buying a boat. It sounds like a good thing, and you reap some instant joy. But in the end it becomes a hole in the water you throw money into. Or in this case, a hole in your network you throw money into. I'll use Indiana University as a case study to try to explain. A short history lesson—a sort of a parable—follows.

Propagation of the Pool

In the 1980s, IU's academic computing organization established a small (<20 lines) modem pool to serve a small and select community of faculty, researchers, and grad students who were big into computing and who wanted to be able to access those time-share machines from home to run jobs, check outputs, or monitor operations. It was a modest pool that cost very little to establish and support, and it paid great dividends in terms of making a small group of influential and powerful people happy. I was not involved in this decision, but I would have done the same thing. At the time I was on the administrative computing side, and we established just a few lines to allow our staff to get into machines for emergency purposes from home. Time, and technology, marched on. Computing centers and organizations merged. And the population of users who desired to get into on-campus resources grew. And new applications started to arise, such as electronic mail, bulletin boards, and other user-focused services (as opposed to techie machine programming and management).

And so the modem pool grew, continuing to "feed the bears" As it became larger, so did the funding required to support it. And funding, always in short supply, meant that modem supply always was outpaced by dial-up demand, and users got busy signals. So much for making a group of influential users happy!

As the 1990s moved on, along came more and more applications that people could access from off-campus. Then came the Web/Internet, and the need expanded beyond campus resources to the world at large. By the mid-to-late 1990s, everyone needed to be connected regardless of time and place.

So the over-burdened, always-busy modem pools at IU became a constant source of irritation and outrage to the user community.

Every year, in our annual user satisfaction survey, modem availability was the Number One complaint. After all, this remote access was in support of university missions for teaching, learning, research, and service. It became more than an entitlement, it became a "right" of faculty especially, but also of students trying to get online to do assignments for that same faculty. And those rights being denied (through constantly consumed modem pools) by the IT organization led to even greater dissatisfaction. Our users were 'madder than hell and not going to take it anymore!'

In 1998, IU's groundbreaking IT Strategic Plan (http://www.indiana.edu/~ovpit/strategic/), written by that same user community as a roadmap for advancement in technology infrastructure and service by the central IT organization, included a major recommendation on access to IT resources and services. And a key direction, action item #5, involved remote access (i.e., modems). It said, in very easy-to-understand language in the interpretation comments: *"No Busy Signals!"*

With that mandate, strategic funding was directed into the modem pools at the two core campuses (Bloomington and IUPUI in Indianapolis), and the pools grew enormous: ~1,800 at IUB and ~1,100 at IUPUI. And so did the investment in this service—more than $700K per year in PRI telephone line charges, and over $500K in hardware.

With this investment, we discovered the legendary "peak in the demand curve"—and we met that demand. No busy signals. Ever. Room to spare. We were heroes! Other items rose to the top of the user complaints in the annual satisfaction survey. But busy signals were banished. All was right with the world. Right, except for that $700K annual cost.

One good thing about the IU IT Strategic Plan's action item #5 was that it didn't just say, "Add modems." In the actual action item charge, it wisely talked about the more generic issue of *reliable access*. At the time it was published, the very first inklings of the next stage of technology were emerging. This, of course, meant that our charge was to develop new, high-speed services. These high-speed services (Broadband: DSL, cable, etc.) would not be something the university itself could get into the business of providing. Rather, they would be vendor-provided services in our communities, coming into users' homes along with the telephone lines and TV programming. It became apparent that the natural evolution of remote access, as dictated by the IT Strategic Plan, would provide a revolution in the historical role of Institution as ISP. Bravo!

...every time I guest lecture on campus, I always ask if anyone is using modem pools. Rarely, maybe one or two hands will sheepishly go up.

After the Apex

At IU we have seen significant migration off our low-speed modem pools and onto vendor-provided, user-contracted broadband services. Of course, no longer is Internet access really considered by most faculty, staff, and students just an item required by their association with the university. It is now being viewed increasingly as a utility for one's home—just like water, gas, sewer, phone, or cable TV.

It is no longer used by the household university-affiliate; it is a commodity used by everyone—spouse, children, visitors, and others. As of Spring 2004, we've seen about half of our users establish broadband connectivity in their homes, and they no longer use our modem pools. Because really, surfing today's multimedia-rich Internet on a 56K dial-up is as productive and exciting as watching grass grow. And through this natural migration, we've managed to reduce the modem pools (and still retain the 'no busy' service level)to their pre-IT Strategic Plan levels (about 1,000 lines at IUB and 700 at IUPUI).

So how about our short-term view for the next 12-18 months? Our plans are still forming, but in reality, the key people who rightfully drove the process of expanding the modem pools in past decades—the IT-savvy faculty, and our student community—have moved on. If you ask our primary IT advisory faculty, nearly all of them have broadband access at home, right along with their HBO. In fact, many have been able to justify and fund the cost of the broadband service by dropping the second home phone line they had (so that they could be online on the IU modem pool and not, themselves, create busy signals for someone trying to call them at home).

As for the students, every time I guest-lecture on campus, I always ask if anyone is using modem pools. Rarely, maybe one or two hands will sheepishly go up. Most times, the students look at me like I'm from Mars (*"What's a modem pool, Mr. Voss?"*). And those students who don't live off-campus, well, they're in our wired-to-each-pillow residence halls, which also get wireless access beamed from new-technology phase-array antennas through their windows. In truth, we're still getting demographics regarding just who is using the modem pool today. But it appears from anecdotal evidence that it's not leading IT faculty, and it's not the majority of the student population.

So perhaps the time is about here when the rallying cry *'No Busy Signals!'* is less a cry and more a whimper. I don't see us ever fully eliminating the free access modem pools. But I am confident we will scale them back to much smaller levels, and deal with the fact that they may, once again, have busy signals.

Morals for Modems

What's the moral? Let me give you some itemized arguments to use when someone suggests that you start a modem pool in the 21st century. Or you can use them as ammunition if you're looking to dry one up that was established by you, or your long-gone predecessor, in the 1980s or 1990s.

Dead technology. Low-speed dial-up is becoming useless. You can't effectively surf the Web of today with it. You can't use it to do one of the most popular activities today—downloading. Lower speeds were fine when you were in character mode; but what is left that's like that today? And if there still is any of that, it won't be around long.

Oh, what about those five-times-faster claims of some ISPs for their dial-up modems? Can't universities install that? Smoke and mirrors, friends. They're simply using compression algorithms, and that does little for improving overall performance. It's slick marketing meant to squeeze every last drop out of an already-made investment by ISPs who can't get into the broadband game.

Scarce funding resources. Higher education is, across the board, being pressed financially. Modem pools are not cheap. Given the dead technology issue, do you really want to invest your scarce resources in this area? Wouldn't the funding be better spent on more Internet capacity and network security? New wireless access infrastructures? Building fiber on-ramps from the institution to the Internet? And these are just in the telecom area of IT. Add in all the demands for new funding for information systems, user support and services, and research-focused computation and storage. Where does low-speed dial-up fall in that list?

Institutional role. Given all the broad funding pressure, is it really in the institution's best interest to become an ISP for its faculty, staff, and students? Outsourcing has become, and continues to be, a big topic in higher education; since when is "being an outstanding ISP" part of any higher education institution's mission-centric strategic plan?

Equity. Is it really fair that the institution provides open, free access for what has become a household utility, while most members in the university community pay their own freight? Oddly—and this is just a suspicion—my guess is that the biggest remaining user base of low-speed modems are faculty and staff. So this is less about access for students to learning resources, and more about basic Internet access for these employee households. I don't mean to widely cast aspersions; I'm sure there are some underpaid individuals who use the resource to do their jobs and nothing else. But in general terms, the day of this being a faculty-entitlement, or an employee benefit, seem to have passed.

Funding reallocation. For those like IU that have had huge modem pools (and the equally huge budgetary investments) I'm not advocating that the funds saved from their devolution will go to party-hard. We have so many unfunded technology mandates. Wireless networking is a major new one, because it does not replace well-wired networks on our campuses; it expands and complements them.

Network security—from firewalls to Virtual Private Network (VPN) servers (that secure those wireless and broadband remote services)—is another new area of investment. With Internet expansion, costs go down, but demand continues unabated. More investment is needed, including the building of optical on-ramps that will better connect the institution to its neighbors and collaborators, and the developing national cyberinfrastructure. All these areas are essentially new money initiatives. These services are, in the view of most IT people and most users of IT services, critical to the continued ability of IT to be a strategic enabler of the larger university mission in teaching, learning, research, and service. Wouldn't it be grand if we could look at our modem pools as a funding source to provide these new services?

In the end, I do believe we must retain a focus on remote access. We should enable it through working to leverage the buying power of our institution(s) in trying to get better rates for broadband services from the competing providers, into homes in our communities. We should work with providers to establish peer relationships, which will, in the end, help improve performance for both our users on their networks, and their other users (as load is shunted off directly to our campus networks). We need to continue to work on securing our networks while making it possible for "anytime, anywhere" access to institutional data and resources through technologies like VPN. Let's have our IT organizations do these things, instead of running modem pools.

We need to continue to work on securing our networks while making it possible for "anytime, anywhere" access to institutional data...

In the end, let's consider modems another bit of historical technology, past its useful era, that needs to go onto the technology discard heap. Along with dumb terminals, floppy disks, monochrome monitors, non-GUI applications, SNA networks, and a whole generation of x86 technology computers. You wouldn't give more than a nanosecond of thought to implement any of those technologies for on your campus, right? Same for modems.

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- **The University of British Columbia** adopted wiki, a collaboratively-edited Web site allowing users to edit any page, with full freedom to edit, change, and delete.
- **Wharton School of the University of Pennsylvania** provides Web-based tools for collaborating and sharing information.
- **Boise State University** implemented a wireless system helping to authenticate their network.
- **California State University-Northridge** rebuilt their enterprise mail system to support two million messages a day.

The University of British Columbia ▪ By Brian Lamb

Taking a Walk on the Wiki Side

A pilot project by the University of British Columbia utilizing the online environments known as "wikis" began modestly, but an enthusiastic response across campus has rapidly increased the scope of its use. The radical simplicity and versatility of wikis has encouraged individuals and groups to develop novel uses for the technology, producing impressive results with minimal resources. However, the very qualities that make wikis so successful as a grassroots-oriented pilot can also create corresponding challenges as the project grow. It will prompt difficult decisions about suitable use by the institution and users.

The term "wiki" (the Hawaiian word for "quick") is applied to many systems with wildly varying features. Any user can edit the content of the page through a Web browser—authoring software, permissions, or passwords are typically not required.

UBC's Experience

University of British Columbia's pilot began on a small scale, with an instance of the UseMod wiki system (http://www.usemod.com) installed to support individual use and experimentation within the university's Office of Learning Technology. UseMod runs under UNIX or Win32 with either Apache or IIS, and the code is in one Perl file with all configuration variables readily accessible.

Wiki adoption at the University of British Columbia has since grown spontaneously. The quick access to the authoring interface and the simplified mark-up language invites participation and experimentation by just about any user, and the resulting spirit of adventure has resulted in a diverse array of applications:

- Jim Sibley of the Faculty of Applied Science Instructional Support at UBC, links wikis into its WebCT authoring environment so that course design teams can quickly and collaboratively build reference lists, course outlines, brainstorm instructional strategies, and complete systematic questionnaires.
- The Career Services unit is using wiki pages to prepare content for a major site redevelopment presenting job postings and career education. Authoring can proceed without waiting for the technical framework of the site to be completed.
- Teresa Dobson, assistant professor of Education at the University of British Columbia is using the wiki space in both her teaching and research. Her graduate course on technologies for writing employs the wiki to support collaborative experiments in composition, and as a prompt for reflection on the nature of online writing and reading.

Pilot to a Enterprise Application

An enthusiastic response presents its own challenges as the technology becomes more widely adopted. As users apply wikis more commonly in their practice, they increasingly come to depend on them. A power failure on campus rendered many Web servers inaccessible over a weekend. Though data was backed up and there were no lost pages, students who had projects stored exclusively on their wikis experienced considerable anxiety with deadlines looming.

Technical quirks of wiki systems, indicative of the often anarchic programming communities that have developed them, also need to be considered. Different wiki systems may store content in distinct ways—resulting in significant programming challenges when migrating material from one system database to another.

As with any new technology, there's bound to be growing pains as wiki adoption grows in academic settings. But there is no denying that the simplicity and flexibility of wiki environments offer tantalizing possibilities along with the challenges. Just like the spaces they foster, the future for wikis is wide open.

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Wharton School of the University of Pennsylvania ▪ By Rob Ditto

Teaching and Learning Through Online Collaboration

Since 1998, the Wharton School of the University of Pennsylvania has integrated collaboration software based on Documentum's eRoom into the school's learning environment. Faculty members in all 11 Wharton academic departments utilized Wharton's collaborative courseware environment in over 400 courses each year, teaching more than 6,900 students across all of the school's curricula.

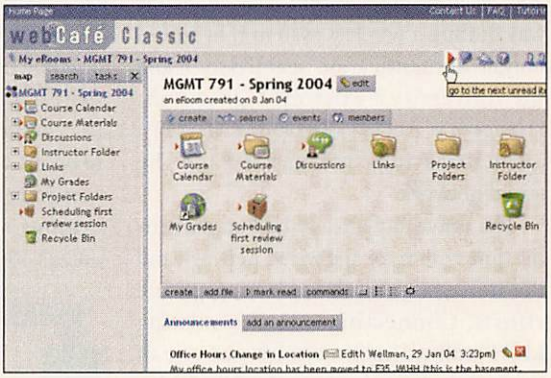
Keeping Focused

A major revamp of Wharton's MBA curriculum emphasized collaboration and teamwork as a key component of the learning process. Wharton's IT staff selected its course support software strategy to reinforce that aim. With tools to do project work asynchronously—from anywhere at any time—each group's face time could focus on brainstorming and other interpersonal learning activities.

The Wharton School built a custom learning environment based on eRoom. It offered easy adoption by faculty, strong collaboration tools, and the ability to integrate with the school's existing authentication system—so students could use the usernames and passwords they use for other online services at the school. Having observed students commandeering tables in the school's cafés and lounges for group meetings, Wharton chose the name web*Café* as the internal "brand name" for this Web-based collaborative environment.

An instructor can get started quickly by uploading syllabi or readings prepared as PDF or Word documents. As the semester proceeds, lecture slides and supplemental files added by the instructor are automatically indexed for searching and are summarized in a nightly e-mail and sent to the members of that class. Discussions, used heavily in courses with problem sets, allow questions from individual students to be answered for the whole class.

Wharton's web*Café* support team established a practice of creating "electronic rooms" (eRooms for courses) based on a common template with designated areas for discussions, links to other sites, and folders for individual or group projects. Within the project folders, students post and review drafts of papers or presentations, make comments on works-in-process, and use eRoom's native versioning and progress tracking capabilities. Students can use the access-control feature to make project folders private; an additional private folder, visible only to the teaching team, provides a staging area for new content.



In a webCafé "electronic room," or eRoom, Wharton faculty members supplement their classroom teaching with an online environment designed for student collaboration.

Supporting Learning Needs

Other key features emerged through subsequent development efforts. eRoom's API (application program interface) allows the team to develop custom capabilities through Windows Scripting, Active Server Pages, and Component Object Model-based applications. The team's first API project automatically synchronized course eRoom membership with class enrollment. The custom enrollment program also allowed instructors who teach the same class several times a day (in related sections in different departments or programs) to use a single shared room—a feature lacking in many course management software applications.

Wharton soon began using the API not just for administrative tools but also to add new features for learning support. A Team Signup tool helps students quickly assemble into teams and gain access to automatically created private team folders. A custom-developed Grade Book tool allows faculty to use eRoom's Database feature (for displaying information in rows and columns) to enter grades for students securely within a private folder. A student-accessible My Grades link allows each student to see only his or her grades. Additional teaching tools, such as quizzes and evaluation forms, have been added to the environment by using eRoom's API to integrate third-party tools such as Cogix ViewsFlash survey software.

Driving Success

A key to the success of Wharton's web*Café* platform has been the willingness of faculty to incorporate collaboration-based learning tools into their courses. Through a related initiative called the Alfred P. West, Jr. Learning Lab, Wharton developers work with faculty to create experiential-based collaborative learning exercises that incorporate real-world scenarios. At Wharton, the faculty, students, and IT staff are prepared to meet the collision course of collaboration and learning head-on.

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Boise State University ▪ By Brian McDevitt

Smart Practices—Finding a Wireless System

Boise State University, located in Idaho's capital, provides unique opportunities for students to live and learn in the center of government, business, arts, high technology, and health care. The university wanted to offer its students and faculty wireless Internet access throughout its 134-acre and 34 building campus. The challenge was finding a wireless system that would handle authentication seamlessly using the university's existing Lightweight Directory Access Protocol (LDAP) authentication system used for the wired network.

The university already had an authentication system for the wired network and the university didn't want to duplicate efforts. Connecting into the existing LDAP authentication system was one of the main criteria as the university evaluated several systems.

The new security system also had to handle Boise State's high traffic demands and would need to scale easily to manage the load. The biggest challenge was in the dorms—students introducing overloads or viruses into the network. The university needed to implement the new system in the dorms to make sure the users were authenticated.

Once Perfigo's SecureSmart system was in place for evaluation, it was able to check all traffic at the edge, reducing the load on the authentication server. The university believes that open box software is optimal. The university could crack open [or hack into] the [other vendor's] box but the new system could not be compromised.

The system protects Boise State's data and prevents unauthorized access by requiring wireless and wired network users to enter a valid user identification and password. The server authenticates against the university's LDAP database, and allows or denies access accordingly. After verification, users are able to fully utilize the local network and Boise State's Internet connection. It provides a centralized, single point of management for the university's wired and wireless networks and SecureSmart deployment.

Solid Security for High-Traffic Network

Wireless access is available in every building on every floor (the university has more than 50 Cisco access points), except in dormitories, where high-speed network connections exist. Public access computers are also available across campus at student unions and in the

dorms. SecureSmart is able to handle wireless, which they expected, but also the wired traffic, which is significantly heavier. Even streaming media passes through without causing a bottleneck.

Viruses and worms add significant costs to budgets in terms of resources, time, and revenue lost, in the case of a network being brought down. Furthermore, wireless devices are a bigger threat than wired devices because viruses can be obtained anywhere and brought back to the network to infect other devices.

Boise State is in the process of implementing Perfigo's CleanMachines and virus and worm prevention system, which prevents the spread of viruses from mobile devices that log onto its network until they are verified as virus-free. The system stops any potential for damage at the user edge by determining which users are at risk, preventing full network access, delivering updates to them, and enabling users to fix their own devices rather than assigning costly resources to do it. Once the user has applied the up-to-date virus protection and other necessary patches, they are allowed onto the network.

Savings

The biggest advantage the university gains with the new system is that it doesn't require daily maintenance and management—because it's external. The box is rarely under load or having any problems.

Before finding Perfigo, the university did not authenticate dorms because it was such a cumbersome task. The university couldn't authenticate those users, they would spend numerous hours a day tracking machines with viruses or trying to catch abusers. The university knows how to reach any machine, when they get an e-mail from another university informing them that a Boise State student has a virus or is trying to hack into their network and they can go directly to that person based on information they already have. It saves time and headaches.

Boise State University responded to the demand for wireless access by its students and keeps up with increasingly technological needs. True scalability is the key to quickly and easily expanding and supporting more applications, as well as users, without necessarily adding more equipment.

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California State University-Northridge ▪ By David Sorkin

New E-Mail System—Meeting the Needs of Students and Faculty

The halls of academia depend on fast-flowing, unencumbered, virus-free e-mail. You practically can't get through school without it. In fact, at least one survey shows that 93 percent of American college students regularly use the Internet, making them the most connected segment of the population. And e-mail use is at least as popular as Web-surfing.

At California State University at Northridge (CSUN), a 353-acre campus in suburban Los Angeles, e-mail is an important facet of college life. CSUN serves 28,000 students and a faculty and staff of more than 3,300. Like so many other institutions, CSUN built its e-mail infrastructure a number of years ago.

The hardware and software of the old system were so antiquated that the system administrator had to reboot the system once or twice a day just to keep the application running, and mail delivery often took an hour or more. The poor service led some departments to deploy their own e-mail systems on campus.

The university realized it needed a new e-mail system, the requirements for which were clear: an integrated solution that could provide Web-based e-mail, calendaring, anti-virus software, content-filtering—all in one easy-to-use package.

In the fall of 2002, the school's IT department decided to rebuild its enterprise mail system with the help of Mirapoint. As a result, today's e-mail volume at CSUN—a peak capacity of two million messages a day—is a long way from much-slower SGI days.

Advance notice to students and university personnel came through the campus newspaper, e-mail announcements, and the university's Tidbits announcement service, published by the University Support Services Group.

Under the new system, CSUN can flexibly configure Mirapoint's technology to fit their specific needs. When the anti-virus application is enabled, CSUN officials can expect delivery capacity to be approximately 500,000 messages per day. If anti-virus service is not needed, the system has the potential to support more than two million messages per day.

Using the new system's class-of-service controls, administrators can easily define which services are to be provided to which particular users and domains. For example, class-of-service allow administrators to configure certain service packages for faculty and other packages for students.

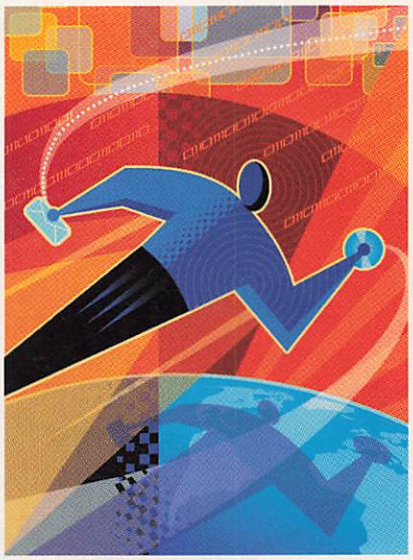
CSUN's new system is designed around services. Students, faculty, and staff can now take advantage of POP and IMAP e-mail. The system supports desktop clients such as Microsoft Outlook, offers Webmail and access from wireless PDAs, and has advanced collaborative features. The system is LDAPv3-compliant and iCal- and vCal-ready. These were important considerations in a university with some 5,000 desktop computers and an unknown—and proliferating—number of laptops, PDAs, integrated telephones, and tablet computers.

Downtime is no longer a problem at CSUN. The system has been up and running 99.99 percent of the time. Over the last year, the only time it was down was for the installation of anti-virus software.

The mail store is configured for 400GB mail storage and can be easily increased to handle even more. The system handles the widely varying mail needs of students and faculty members, some of whom are not university-based—such as vendors and alumni.

Helping to keep the system secure is a university-wide policy that requires users to change their password every 90 days. IT technicians have programmed the system to remind each and every user that they must update their profile by creating a new password ten days in advance of the date that they must make the change. The system continually reminds users, until the deadline arrives.

Even if earthquakes strike the area, data will be safe. CSUN's failsafe system is about as good as it gets. Most servers in the university's data center are connected to redundant power supplies. Backing that up are UPS's—for uninterrupted power supplies—and backup generators. In the event of an electrical blackout, CSUN generators, powered by diesel engines, will last indefinitely.



Migration to the new system took place only ten days—in September of 2002. About 50,000 user accounts were migrated, and the old directory was cleaned up.

The new system's speed is lightning fast. Normal mail delivery, if not instantaneous, takes no longer than two seconds—or if the server is very busy, perhaps 30 seconds. Complaints about slow-mail delivery are nonexistent.

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FEATURED PRODUCT ■ SYMANTEC GATEWAY SECURITY 5400 SERIES

Blended Threats Demand Integrated Defenses

The trend in the technology of firewalls, naturally enough, follows innovations in the threat. So when the hacker community began hitting the Internet with what are being called "blended" threats—an amalgam of virus, worm, Trojan Horse, and other malicious code—security developers followed suit. The result has been the emergence of security in a box—integrated solutions that combine multiple layers of defense and response mechanisms.

The latest firewall offering from Symantec Corp., a developer of the Internet security technologies, is a good example of this strategy. The company's Gateway Security 5400 Series is a line of firewall appliances that offers protection against various types of threats, including blended threats such as Blaster, Slammer, and Sobig. Through the path of integration, the solution reduces network security costs and provides gateway-level protection by integrating full-inspection firewall, intrusion prevention, intrusion detection, antivirus, content filtering, virtual private networking (VPN), and anti-SPAM technology in a single device.

The Symantec Gateway 5400 Series also centralizes policy configuration management via Advanced Manager, a plug-in for Symantec Enterprise Security Architecture. The Advanced Manager provides secure and centralized Web-based management of hundreds or even thousands of appliances. Although centralized logging, alerting, and reporting is available, these appliances can also be managed individually with the included secure, Web-based Symantec Gateway Management Interface.

The company offers three models of the 5400 Series, varying in performance and scalability. With the addition of high availability, load balancing, and state sharing, clusters of appliances can be configured to support the needs of sites ranging from small office environments to campus-size networks. "It's an ideal solution for campus networks because of its central manageability and the option that it affords to administrators to use only the security features needed at any one location," according to Symantec spokesman David Forstrom.

A number of high-availability options are also available which include a hot standby—where a second system follows the transactions of the primary system and takes over when the primary fails; or active high availability—where a cluster of systems operate and share the load. The appliances are also flexible enough to operate within current network environments as part of an overall multi-tier, multi-platform security plan.

Symantec offers its Gateway security customers "Security Response" services, a team of intrusion experts, security engineers, virus hunters, threat analysts, and global technical support teams that work in tandem to provide extensive coverage for enterprise businesses. Symantec Security Response also leverages sophisticated threat and early warning systems to help guard against blended Internet threats.

The Gateway Security Appliance 5400 Series is offered in three models (5420, 5440, and 5460) in order to accommodate varying performance needs. The flexible licensing enables customers to get the license size and security functions that best meet their corporate needs, the company says. Customers also receive up to one year of telephone support, advanced replacement, upgrade insurance, and content updates included with the licenses.

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- Automatic image optimization
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FEATURED PRODUCT ■ SERVGATE EDGEFORCE

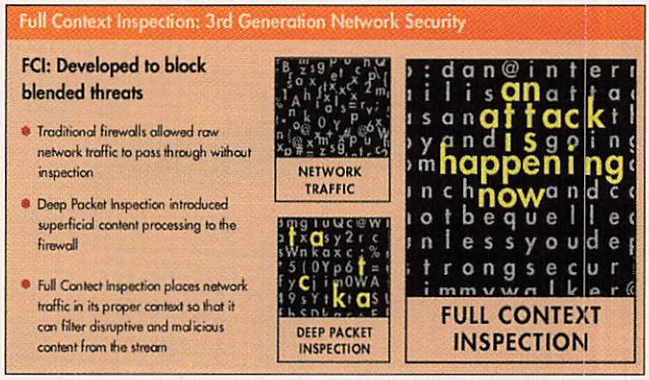
Blocking Blended Threats

The rules of the security game have changed. Contemporary attacks on college and university networks are increasingly more sophisticated and have become incredibly destructive. Furthermore, regulatory pressures and litigation risks require a more comprehensive approach. The latest breed of viruses such as myDoom and Sobig.F uses extremely complicated and evasive blended threats, which disparate point security solutions—separate firewall, VPN, and virus filter—simply fail to defend.

According to ServGate Technologies, protecting campus networks against such attacks requires an integrated edge defense that thoroughly examines the content of network traffic. ServGate EdgeForce integrated modular security platforms are designed to provide protection against harmful attacks by providing firewall, URL filtering, virus screening, SPAM filtering, and VPN technologies in one secure platform. This inclusive approach to security provides a solid front against threats at every layer of the network while also reducing the costs associated with sourcing, maintaining, and managing disparate solutions.

The EdgeForce modular architecture allows new security services to be added as new threats and services arise. Its ability to incorporate additional performance and security features in a single unit allows IT managers to deploy the performance and applications they need, as they need them, without disruptive client and server equipment upgrades.

To combat the complexities of blended threats, ServGate developed a technology called Full Context Inspection (FCI) to screen packet contents in real time to block suspicious traffic before it can do damage to a college or university network. Full Context Inspection goes beyond deep packet inspection, examining the context of network traffic, thus reducing the risk associated with sophisticated attacks. ServGate's Full Context Inspection technology provides a deep level of blended inspection by analyzing reassembled network traffic and performing content security filtering services such as virus and SPAM screening on complete context at the application layer.


Full Context Inspection: 3rd Generation Network Security
FCI: Developed to block blended threats
Traditional firewalls allowed raw network traffic to pass through without inspection
Deep Packet Inspection introduced superficial content processing to the firewall
Full Context Inspection places network traffic in its proper context so that it can filter disruptive and malicious content from the stream
NETWORK TRAFFIC
DEEP PACKET INSPECTION
an attack is happening now
FULL CONTEXT INSPECTION

Security is a trust brand market. ServGate's modular architecture can deliver solutions such as McAfee Security anti-virus protection. As a result, the EdgeForce platform can perform 100 percent screening at the network edge, inspect packets before destructive content enters the network and protect college and university networks from the dangers found on the public Internet.

ServGate has integrated the SPAM filtering engine from McAfee Security into its security hardware platform. EdgeForce can be inserted into any existing network to provide a SPAM filtering solution for any size campus. Powered by McAfee Security SPAMAssassin and tuned for optimal performance, the EdgeForce provides out-of-the-box SPAM filtering that can be implemented in seconds at a fraction of normal cost.

The SPAMAssassin engine uses a rating system that scores e-mail based on a sequence of tests. Ninety-five percent of all SPAM e-mail will be tagged with the out-of-the-box configuration. The engine provides a very low false positive identification rate of less than 0.05 percent. This default rule set does not require any further configuration unless otherwise desired.

The scoring system used to determine whether a particular e-mail message is SPAM consists of thousands of rules that are run against every e-mail. Both positive and negative weights are assigned to each rule and a composite score is attached to each scanned e-mail. This composite score is then compared to a SPAM threshold value for the organization and the e-mail is marked SPAM if the threshold is violated. The engine also uses historical information to optimize the scoring of individual rules, recognizing patterns of its own function.

EdgeForce SPAM Filtering can scan both incoming and outgoing e-mail, significantly reducing wasted network bandwidth. Filtering SPAM at the network edge greatly increases workplace productivity, as employees do not have to be burdened with wasteful content in their e-mail inbox.

To protect campuses from inappropriate content, and guard against misuse and abuse of valuable network resources, an integrated Web filtering service that outright blocks URLs is also key to the blended defense strategy.

For more information, visit www.servgate.com.

PRODUCT ROUNDUP

Firewalls

Firewall and network security technology are no longer an optional piece of campus network technology. The good news is the growing sophistication of the threat is having a direct impact on the creativity and scope of the technology coming out of the labs. Here's a sample of recent network protection technologies that range from spot solutions to integrated solutions to internal solutions to architectural solutions.

Check Point Technologies InterSpect

With its recent security offering, Check Point Software Technologies takes an inside-out approach. Check Point's InterSpect is what the company is calling the first complete "internal" security solution, meaning that it provides security for safeguarding networks from damaging attacks that are introduced inside the network.

Organizations may defend against cyber attacks, only to have the network become infected again as soon as one of its "road warriors" returns to the office and reconnects their laptop. An example of an attack that propagated among users of the network after being introduced by an internal source includes the Blaster worm that caused an excess of $500 million in damages.

The InterSpect system is a security appliance designed to be deployed inside enterprise networks.

InterSpect blocks the spread of worms and attacks inside the network through Check Point Stateful Inspection and Application Intelligence. The technologies segment the internal network into organizational security zones to contain a potential attack and minimize unrestricted employee access. In doing so it quarantines suspicious computers and isolates attacks.

Contact: ***Opsec****, Redwood City, CA; (800) 429-4391; www.opsec.com.*

Internet Security Systems Proventia

ISS takes yet another approach—security integration via the enterprise architecture. ISS's Proventia Unified Protection Architecture (UPA) is a network security architecture that unifies all protection technologies into a single engine that enables protection across all Proventia gateway, network, server, and desktop products.

The UPA is designed to integrate the following security technologies: firewall, VPN, antivirus, intrusion detection, content filtering, anti-SPAM, and application protection. The UPA also unifies common management functions like command and control, discovery, visualization, correlation, deployment, reporting, and workflow analysis. Standalone security devices all have their own separate management console, requiring multiple resources to manage all of these functions.

The Proventia UPA is supported by synchronous deep traffic inspection that performs packet inspection functions all at once, rather than sequentially, to open, analyze/detect, block/allow, reassemble, route, and log packets. This single process removes the redundancy of stand-alone network security products, which conduct similar packet examination functions separately.

The UPA Architecture provides multi-layered network security from a single protection engine. Proventia protects at the gateway, network, server, and desktop and is managed centrally by SiteProtector. Therefore, enterprises only have one product to acquire, certify, test, install, manage, and update across their entire network infrastructure, greatly simplifying security.

Contact: ***ISS****, Atlanta, GA; (800) 776-2362; www.iss.net.*

Lucent Technologies Virtual Private Network

Data security and virtual private network (VPN) technology is no longer a "nice-to-have." It's a requirement. Yet the daily news reports tell the story: denial-of-service attacks, hacker intrusions, crippling viruses, database penetrations, alteration of financial records, Web site tampering, and certification advisories.

Lucent, the former Bell Labs, offers a broad portfolio of security technology, including Security Consulting Services to help plan, design, implement, and support the security services. Other features include the VPN Firewall Brick family; Lucent Security Management Server, and PISec Client. Besides the technology, Lucent offers the experience and skills it takes to integrate security technology into your existing infrastructure, maximize ROI, and create world-class security solutions.

Contact: ***Lucent Technologies****, Murray Hill, NJ; (908) 508-8080; www.lucent.com/security.*

Sygate Security Portal

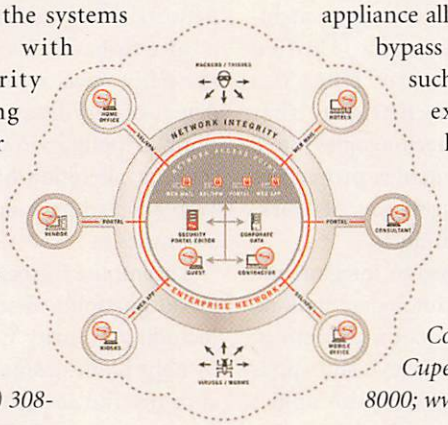
Sygate Technologies makes enterprise-level security tools. Its latest technology, the Sygate Security Portal, is software that extends an organization's security polices to external or remote workgroups and devices controlled by third-party suppliers and contractors.

The company's flagship product is Sygate Secure Enterprise, which protects enterprise networks by preventing unsafe end user behavior and eliminating unauthorized devices. With SSP, organizations can extend security to non-corporate-owned equipment by verifying the security integrity of a

device, creating an encrypted virtual desktop environment, and then erasing the data from the system upon termination of the session.

The Security Portal creates a downloadable plug-in, called Sygate Virtual Security Agent (SVSA), that works with existing Web applications to determine whether the device is corporate-owned and or non-corporate owned. SVSA then ensures that non-corporate owned devices accessing the systems are compliant with corporate security policy, eliminating the potential for them to be exploited as a back door for hackers, trojans or worms.

Contact: ***Sygate****, Fremont, CA; (866) 308-8899; www.sygate.com.*



Sygate Security Portal

Symantec Firewall/VPN Appliance

Another all-in-one security approach comes from Symantec, whose Firewall/VPN Appliance provides secure Internet connectivity between locations. In widespread and often remote campus architectures, the Firewall/VPN Appliance can create a high-speed local network that enables secure access and interaction via the Internet.

The appliance offers offices or departments with up to 40 employees a turnkey solution for securing outbound and inbound Web, e-mail, FTP traffic, and more. For larger, dispersed organizations, it offers a solution for extending firewall protection and gateway-to-gateway VPN access to satellite offices and branch locations and a remote client-to-gateway VPN for traveling users.

A built-in 10/100Mbps Auto-Sense switch simplifies system set up, and provides a plug-and-play LAN for office PCs and printers with no additional devices required to connect networking-enabled systems. To ensure continuous connectivity, the security appliance features an automatic backup that enables dial-up connections using an external modem in the event of broadband ISP service disruption. In addition, IP address sharing, IPSec passthrough, and VPN tunneling enable it to be adapted to changing requirements.

Symantec says its Firewall/VPN appliance allows organizations to bypass many capital outlays such as the need to lease expensive dedicated lines and the necessity of maintaining remote access servers and large modem pools.

Contact: ***Symantec****, Cupertino, CA; (408) 517-8000; www.symantec.com.*

Teros Secure Application Gateway

Teros identifies itself as a company that secures Web infrastructures from application-level attacks. That means that its defense is not focused on the attack signature but instead on aberrations in correct application behavior. Its Secure Application Gateways are security appliances that are deployed directly in the data path of Web traffic to block attacks that are not detected by network-based firewalls and intrusion detection systems.

Teros Gateways analyze all bi-directional traffic,including SSL-encrypted communications, to secure application environments. In addition, Teros Gateways protect personal data and prevent identity theft by blocking private information such as credit card, social security, and account numbers before they can leak out of a Web application.

The company's latest offering is Safe Object, a new module for Secure Application Gateway that prevents sensitive data from leaving a Web application.

Contact: ***Teros****; (408) 850-0800; www.teros.com.*

WatchGuard Technologies Firebox X

The watchword in firewalls is integrated security. WatchGuard's Firebox X is designed for organizations that require the same level of network protection as large enterprises but do not have the budgets for multipoint, differentiated security services. The company has a history of addressing the security needs of small and medium-sized enterprises and distributed organizations. It might be a fit for campuses that are growing rapidly and having difficulty keeping up with the expanding variety and sophistication of threats with limited budget, time, and resources.

In contrast to integrated solutions combining older complex technologies that may have been acquired via acquisition or licensing, the Firebox X was built from the ground up to be multifunctional. It has an extensible architecture that allows the new capabilities to be added quickly and easily as the need arises.

WatchGuard Technologies Firebox X

Firebox X features WatchGuard's Intelligent Layered Security (ILS), which incorporates intrusion prevention that inspects and blocks traffic at the application layer. Each appliance features six Ethernet ports, enabling the Firebox X to serve as a perimeter security device and an interdepartmental firewall with an optional three-port upgrade. By segmenting users and devices on the network and enforcing different security policies, organizations can protect against attacks originating from both internal and external sources. The hard drive bay on each appliance provides additional storage that can be leveraged for future functionality such as anti-virus quarantining or on-board logging.

Contact: ***Watchguard****, Seattle, WA: (800) 734-9905; www.watchguard.com.*

Digital Tweed, *continued from page 18*

And technology as an instructional resource? Here's where things get messy. Yes, technology—from film and television to online content and interactive simulations—can aid and enhance instruction and learning. But we do not have a clear definition for instructional productivity or precise methods to measure student learning and outcomes. At the classroom, program, and institutional level, we do not have firm definitions and consistent measures to assess what we do with IT resources or the impact of institutional IT investments and deployment efforts.

The absence of consistent metrics and definitive research—comparable to the data used by economists to measure productivity or pharmaceutical companies to document the benefit of new medicines—means that we occupy an ambiguous gray zone. We are left, knowlingly or not, citing former Supreme Court Justice Potter Stewart's 1964 opinion on pornography; he couldn't define it, but he knew it when he saw it.

So while we many not be able to define academic productivity, we know it when we see it, or more precisely, when we *experience* it. In other words, we have evidence by epiphany.

Unfortunately, evidence by (individual or institutional) epiphany fails to provide the much-needed data and documentation required to respond to questions about the impact and benefits of technology in instruction and institutional operations. We need more than a voice vote of the faculty senate to confirm that IT makes a difference.

For me, the conceptual map charting the impact of IT on instruction and curriculum was published more than a decade ago. Writing in *Change* magazine (Jan./Feb. 1991), and summarizing five years of research on IT and the curriculum for the National Center to Improve Postsecondary Teaching and Learning at the University of Michigan, Robert Kozma and Jerome Johnston were ahead of the curve (and the Web!) in their discussion of key IT issues affecting the curriculum and the continuing IT challenges affecting faculty, academic programs, and institutions. Their 1991 article, "The Technological Revolution Comes to the Classroom" also calls for "systematic assessment" focused on what, in 2004, continues to be the need for evidence about "which innovations make a difference in teaching and learning" and the "need to understand the connection between educational computing, learning, and teaching."

Data from the 2003 Campus Computing Survey reveal that only a third (33 percent) of U.S. colleges and universities have campus initiatives to "assess the impact of IT on instructional services and academic programs." Consequently, it is not surprising that we continue to rely on individual or institutional epiphany for evidence about the impact and benefits of information technology on teaching, instruction, student learning, and outcomes.

Chairman Greenspan's statements linking corporate investment in IT with productivity are important for us in education. His statements confirm that infrastructure fosters innovation and that infrastructure enhancement requires sustained investment. It also means that we need consistent data and continuing assessment efforts. Finally, given the short half-life of IT hardware and software, Greenspan's pronouncements about technology and productivity suggest that IT is really an operating cost, rather than a capital cost.

The current financial challenges affecting American higher education have led some college presidents to talk about "doing more with less, and doing it better." In contrast, the quest for evidence about IT *beyond* epiphany means that we must, simply, do more assessment, do it better, and begin doing it *now*.

***Casey Green (cgreen@campuscomputing.net)** is founding director of The Campus Computing Project (www.campuscomputing.net).*

Trends, *continued from page 8*

or itself uncertain?

(3) *Revocation.* Certificate Revocation Lists. People loose things or move on from job to job. Once issued certificates must be revoked. Keeping track of this as their usage increases is a potentially significant task.

(4) *Single Sign-on.* Private key management. Using your private key is required to decrypt messages sent to you. Do you keep this key in memory (exposed to potential intruding software) or in something more secure like a "Smart Key Card" that you insert into the computer so it can be read when needed? Yet another item to manage and infrastructure to support.

(5) *Password change.* Password quality control. We've alluded to this already. The best privacy in the world is often protected by a password that is simply too easy.

We should move forward with these promising security infrastructure initiatives, but we cannot lose sight of where their real weaknesses lie. The most secure security systems are often protected by passwords based on the names of our favorite animal. Passwords, like underwear, must be changed often. Making them hard to guess makes them hard to remember, but that's true for those trying to steal them, as well. When was the last time you changed yours?

[1] *In practice usually messages in PKI systems are symmetrically encrypted, that is, a randomly generated key made at the time of sending the message encrypts the content and is itself encrypted with your public key and included in the message. The recipient then decrypts the transient key, which in turn is used to decrypt the message content. This is done because it's much faster technically to perform than so-called 'asymmetric encryption').*

[2] *Table modified from Introduction to Public Key Infrastructure, http://www.articsoft.com/wp_pki_intro.htm/*

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Giving users a personalized portal experience is based on numerous determinants such as faculty versus student, undergraduate student versus graduate student, or even undergraduate student taking freshman English at 9:00 a.m. on Tuesday versus 10:00 a.m. on Tuesday.

Northeastern has just touched the tip of the iceberg by doing portal personalization based on high-level role classification—meaning a limited number of student roles. These roles are determined by extracting data from our student administration systems and uploading it into the SCT Luminis platform. The Luminis platform then presents different services to users based on their roles. Northeastern is now planning to deal with the fact that students—and other users—often have different roles simultaneously. For example, a graduate student might also be an undergraduate alumnus. Because the student has dual roles, he or she needs access to information and services relative to both roles, not just one.

Technically enabling and disabling the variety of services at the appropriate times is only part of the process. An equally large effort is needed to educate internal departments on this issue. Departments must now consider and adopt concrete definitions for how long a service will be made available, and to whom. For example, if a student is on academic probation, does he or she still have access to the university e-mail system? What about the ability to pay a book fine or request an online transcript? Will the student get online access to coursework from the previous term? This approach to services is a new mindset for many people and requires them to answer questions they had not previously considered. It is a challenge for the institution to think across functional areas on scenarios that impact individual experiences.

Another factor that determines service levels is licensing agreements with vendors. For example, licensing agreements with library resources often dictate that only current students can have access at the institution's rate. Technically, Northeastern could give alumni authenticated access to its library resources, but we are legally prohibited from doing so by our vendor agreement. Thus, institutions need to be diligent about disabling access to resources when user roles change. Understanding and coordinating all these factors, and making sure to provide the right service at the right time to the right people, takes considerable time and effort.

A final area that requires significant thought and research is session management and appropriate timeout periods for services. Northeastern's e-mail application stays active onscreen for an extended period, even when there is no user activity. This gives users time to think and write thoughtful responses to e-mails. However, financial aid information does not remain displayed on a screen for more than a few minutes when there is no activity.

Although enabling single sign-on at Northeastern was more complicated than we initially envisioned or desired, it was achievable and has been very beneficial. The single sign-on ultimately delivers more than just ease of use. It also increases the usage of systems and resources, thus increasing returns on our technical investments. Support costs for maintaining multiple passwords and users' names have been reduced. In addition, integrating various systems into the portal required the creation of common data sets that have reduced data redundancy and our overhead in maintaining all of the systems.

Ultimately, the single sign-on capability at Northeastern has brought definite, and worthwhile benefits for both the user community and the institution.

Rick Mickool (r.mickool@neu.edu) is executive director of information services at Northeastern University in Boston, Mass.

try to break through them. You need a uniform level of security appropriate for what is being protected. A moat filled with alligators would provide greatly improved security, but it would cost more than my house—the asset I'm trying to protect.

- *If security isn't easy to use, it isn't likely to be used and won't provide much security.* The lock between my house and garage is a technological tour de force, but it is so complex to use that I never bother using it.
- *Security has many interdependencies.* Keeping my neighbors' keys in my house is handy, but if someone gets into my house and finds the keys, my neighbors' security is compromised. The crooks will just unlock my neighbors' front doors. Your security often depends on the security of others, as theirs may depend on yours.

Places that contain security information for many people need the highest level of trust and security. Leaving information with the police and post office is fine, but an unscrupulous person in either place would know which houses are vacant and therefore easier to attack.

Security doesn't work unless end users shoulder their share of the responsibility. The best locks and security deterrents won't deter anything if users don't use them. Carnegie Mellon's new computer security CyLab will be doing all the amazing things in the area of security that one would expect them to do. But they will also be training 10 million "Cyberaware" citizens worldwide in three years and educating 100,000 security professionals. It is these millions of "Cyberaware" citizens that will be the most formidable force for improved computer security. Are *your* users cyberaware?

As for the title of this article, it has been lightly encrypted but you should find its solution very e z.

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Howard Strauss

REFLECTIONS

ANOTHER LOOK AT EDUCATION TECHNOLOGY

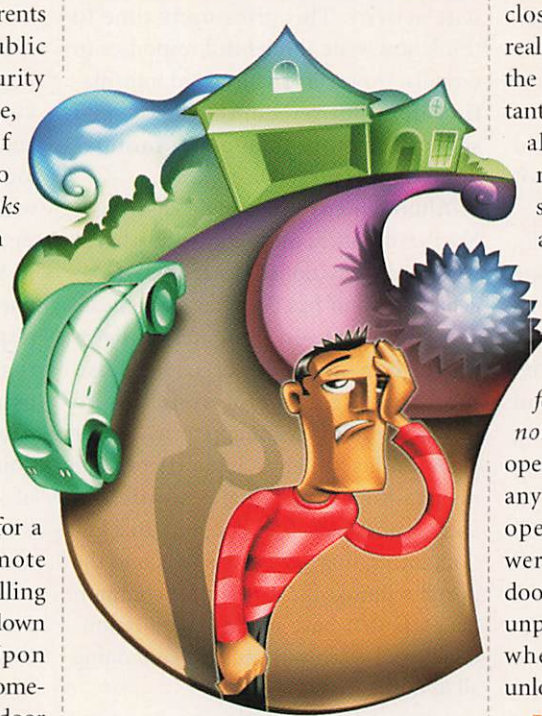
Nzxpmdot Wzbdin Vo Cjhz

My house is very secure. Most windows have quadruple locks. The front door is defended by a $250 solid brass deadbolt. The back door has a double-cylinder armored lock, and my tough-tempered glass window wall has three intrusion deterrent systems. Motion detectors at the front and back of the house keep an eye out for trespassers and there are a host of other deterrents that I will not reveal in this public forum. There is also a high-security lock between my house and garage, but given the inconvenience of using it, I rarely lock it. (Who would know it's not locked? It *looks* locked.) When I'm out of town for more than a few days I notify the local police, who keep a watch on the house. I stop my telltale mail and newspapers and in the event I lose my keys while traveling, two of my neighbors keep a backup key as I keep one for several other neighbors.

Last year, very late heading off for a four-day trip, I pressed the remote control of my ultra-high-tech rolling code garage door and as it started down I sped away to the airport. Upon returning home I discovered that something must have caused the garage door to reverse before closing. It had been wide-open for over four days. Inside the garage, among other goodies were expensive bicycles, a boat, and every known device for waging war on fall leaves. The door from the garage into my house was, of course, not locked. Amazingly, not a thing was missing or even moved. My neighbors said they thought I was working long hours in my garage since it was open from very early in the morning until they went to sleep.

Here are some lessons from this incident that apply equally to computer security.

- *Do not confuse being lucky with good design or a big safety margin.* NASA saw seven cases of O-Ring erosion on Shuttle rockets, but none burned through more than a third the distance necessary for catastrophe. NASA concluded that they had a safety factor of three instead of realizing that since there should have been no O-Ring erosion at all, they had just been incredibly lucky—until Challenger when an O-Ring failure caused it to blow up. I could conclude that leaving my garage door open is no problem and that I should never bother closing it since nothing happened. And the unlocked door into my house, well, there's no reason to ever lock it either. Didn't it work just as well unlocked?



Of course, I was just lucky. I need to find out why the garage door didn't close and fix the problem. I need to realize that if it ever stays open again, the lock into my house is very important and always needs to be secured. I also need to have a chat with my neighbors and the police, who were supposed to be looking out for me and ignored a potential security breach for four days.

- *No security feature will protect you if you don't actually use it. Using just some of your security features is often no better than using none.* My rolling code garage door opener never failed, but it doesn't offer any protection when the door is left open. My quadruple window locks weren't much help when my garage door and the door into my house were unprotected. Why pry open windows when you can walk through an unlocked door?

- *The weakest link, not the strongest, determines how much security you have.* Attackers will find and exploit the weakest link in your security. My quadruple locked windows are overkill. They are much more secure than any other part of my defense against intrusion, but no one will ever

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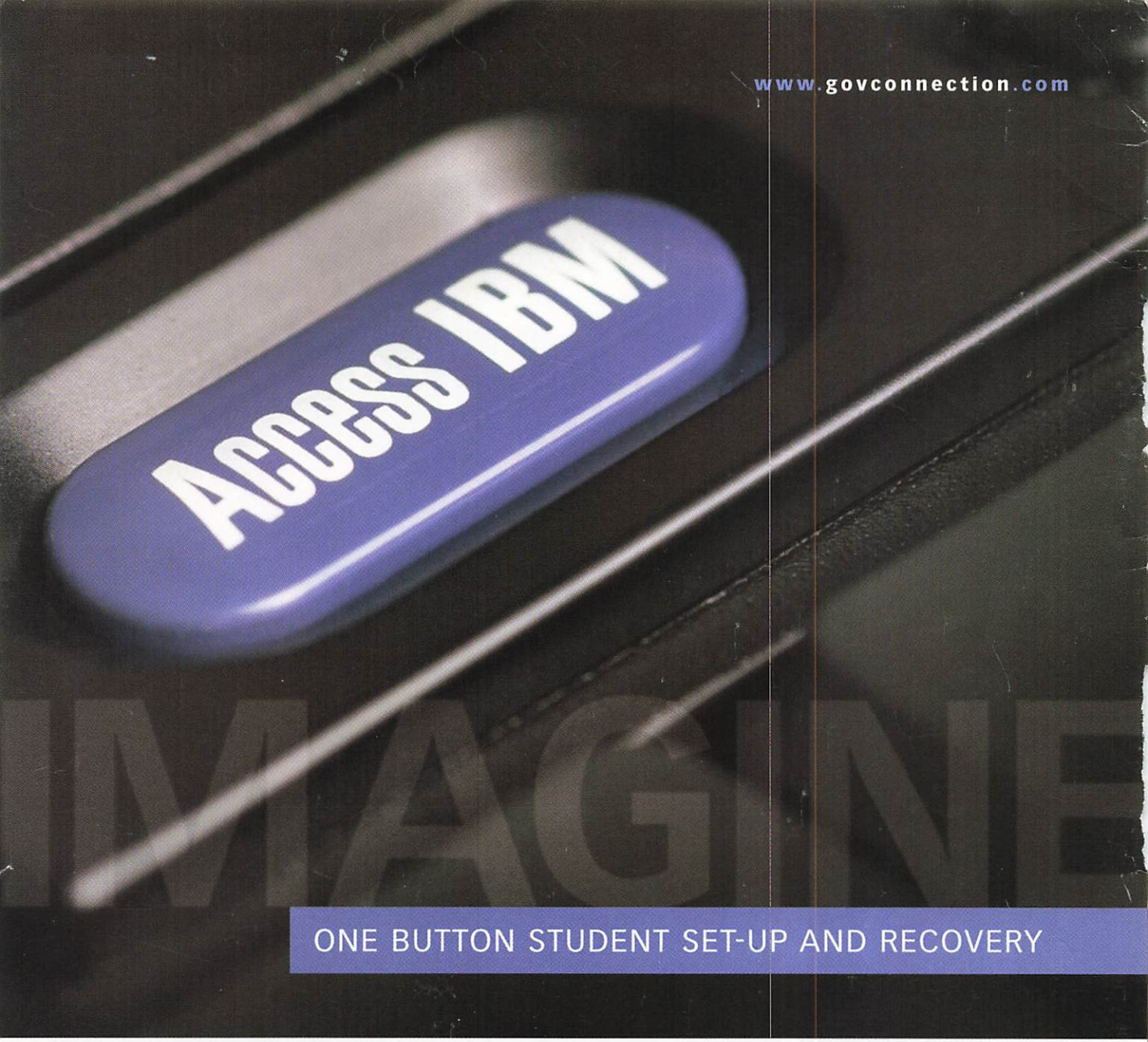

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